TRANSCRIPT OF RECORD.

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1891.

No. 4, Original.

THE STATE OF NEBRASKA, COMPLAINANT,

vs.

THE STATE OF IOWA.

ON BILL AND CROSS-BILL.

IN EQUITY.

BILL FILED OCTOBER 21, 1890.

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1 Supreme Court of the United States, October Term, 1890.

At the Capitol of the United States, in the city of Washington and District of Columbia, being the present seat of the National Government of the United States, on the second Monday of October (being the thirteenth day of the same month), in the year of our Lord one thousand eight hundred and ninety, and of the Independence of the United States the one hundred and fifteenth, the Supreme Court of the United States met agreeably to law.

And afterwards, to wit, on the 21st day of October, A. D. 1890, the following entry appears of record, viz:

2 THE STATE OF NEBRASKA, Complainant,
vs.
THE STATE OF IOWA.

On motion of Mr. J. M. Woolworth, of counsel for the complainant, and in behalf of the attorney general of the State of Nebraska, it is now here ordered by the court that leave be, and the same is hereby, granted to file a bill of complaint herein, and that a subpœna, returnable on the third Monday in January next, be issued herein and served, together with copies of said bill, upon the governor and attorney general of the State of Iowa.

And on the same day, to wit, on the 21st day of October, A. D. 1890, the motion for leave to file bill of complaint was filed in the words and figures following, viz:

3 In the Supreme Court of the United States.

THE STATE OF NEBRASKA
v.
THE STATE OF IOWA.

Now comes William Leese, attorney general of the State of Nebraska, and J. M. Woolworth, of counsel for said State, and moves the court for leave to file its bill against the State of Iowa.

WILLIAM LEESE,
Att'y Gen'l Nebr.
J. M. WOOLWORTH,
Of Counsel.

(Endorsed:) Supreme Court U. S. 1890, October term. No. 4. Original. The State of Nebraska, complainant, *vs.* The State of Iowa. Motion for leave to file bill of complaint. Filed Oct. 21, 1890.

4 And on the same day, to wit, on the 21st day of October, A. D. 1890, the bill of complaint was filed, in the words and figures following, viz:

Supreme Court of the United States. In Equity.

To the honorable the Chief Justice and associate justices of the Supreme Court of the United States:

The State of Nebraska brings this its bill of complaint against the State of Iowa, and thereupon complains and says:

I. In the year 1846 the State of Iowa was admitted into Union, with boundaries as follows:

"Beginning in the middle of the main channel of the Mississippi river at a point due east of the middle of the mouth of the main channel of the Des Moines river, thence up the middle of the main channel of the said Des Moines river to a point on said river where the northern boundary line of the State of Missouri, as established by the constitution of that State, adopted June 12th, 1820, crosses the said middle of the main channel of the said Des Moines river; thence westwardly along the said northern boundary line of the State of Missouri, as established at the time aforesaid, until an extension of said line intersects the middle of the main channel of the Missouri river; thence up the middle of the main channel of the said Missouri river to a point opposite the middle of the main channel of the Big Sioux river, according to Nicollett's map; thence up the main channel of the said Big Sioux river, according to said map, until it is intersected by the parallel of forty-three degrees and thirty minutes north latitude; thence east along said parallel of
5 forty-three degrees and thirty minutes until said parallel intersects the middle of the main channel of the Mississippi river; thence down the middle of the main channel of said Mississippi river to the place of beginning."

II. In 1851 the United States, by its surveyors, ran, marked, and made field-notes and plats of the meander line of the left bank of the Missouri river; which plats and field-notes were duly returned to the surveyor general for that State, who filed the same in the General Land Office, where they were duly approved. The said field-notes described the said meander line from the point where the east line of section 29, in township 75 north, range 44 west, of the 5th principal meridian, touched the east bank of said river; thence to a point where the north line of section 22, in said township and range, touched the west bank of said river, as follows:

Commencing at meander cor. No. 4 (7.74 chains west of the so'west cor. sec. 21, T. 75 N., R. 44 W., of the 5th principal meridian, State of Iowa) of the Iowa meander of the Missouri river in 1851, thence 39 degrees east for 2.88 chains, thence S. 17 degrees east to the Nebraska shore line of the Missouri river at the present time.

Again, commencing at meander cor. No. 4 of the Iowa meander of the river in 1851, thence along said meander line as follows: N. 22 degrees W. for 3.00 chains; thence N. 13 degrees W. for 48.00 chains; thence N. 2 degrees east for 22.00 chains; thence N. 20 degrees east for 8.00 chains; thence N. 55 degrees east for 1.43 chains to meander cor. No. 5; thence N. 63 degrees east for 1.50 chains; thence N. 83 degrees east for 7.50 chains; thence S. 83 degrees east for 3.00 chains; thence S. 80 degrees east for 3.10 chains to meander

cor. No. 6; thence 5.71 degrees east for 2.68 chains to meander cor. No. 7; thence S. 79.50 degrees east for 54.00 chains; thence N. 85 degrees east for 4.50 chains; thence east for 15.00 chains; thence N. 87 degrees east for 5.25 chains to meander cor. No. 8; thence N. 77 degrees east for 34.00 chains to meander cor. No. 9; thence
6 N. 74 degrees east for 30.00 chains; thence N. 71 degrees east for 2.23 chains to meander cor. No. 10.

And your orator believes and charges that the banks of said river between those points were the same when the said State was admitted into the Union as when the said meander line was surveyed and run, and that the said meander line, as described in the said field-notes and plats, was identical with the bank of said river, and is rightly shown on the map which is hereto annexed.

III. In the year 1867 the State of Nebraska was admitted into the Union, with boundaries as follows:

"Commencing at a point formed by the intersection of the western boundary of the State of Missouri with the fortieth degree of north latitude, extending thence due west along said fortieth degree of north latitude to a point formed by its intersection with the twenty-fifth degree of longitude west from Washington; thence north along said twenty-fifth degree of longitude to a point formed by its intersection with the forty-first degree of north latitude; thence west along said forty-first degree of north latitude to a point formed by its intersection with the twenty-seventh degree of longitude west from Washington; thence north along said twenty-seventh degree of west longitude to a point formed by its intersection with the forty-third degree of north latitude; thence east along said forty-third degree of north latitude to the Reya Paha river; thence down the middle of the channel of said river, with its meanderings, to its junction with the Niobrara river; thence down the middle of the channel of said Niobrara river, and following the meanderings thereof, to its junction with the Missouri river; thence down the middle of the channel of said Missouri river, and following the meanderings thereof, to the place of beginning."

7 IV. In 1856 the United States, by its surveyors, ran, marked, and made field-notes and plats of the meander line of the west bank of the Missouri river, which plats and field-notes were duly returned to the surveyor general for that State, who filed the same in the General Land Office, where they were duly approved. The said field-notes described the said meander line from a point on the west bank of said river where the east, north, and south lines of section 15, in township 14, range 13 east, of the 6th principal meridian, in Nebraska, touches the bank of said river, that point being opposite or nearly opposite the initial of the Iowa meander line above described; thence to the point where the east and west middle line of section 1, in said township and range, touched the bank of said river as follows:

Commencing at meander cor. No. 5 (12.35 chains east of the southeast cor. of sec. 10, T. 15 N., R. 13 E., of the 6th principal meridian, State of Nebraska) of the Nebraska meander of the Missouri river in 1856, thence along said meander line as follows: N. 22 degrees

W. for 10.00 ch's, thence N. 32 degrees W. for 16.24 ch's to meander cor. No. 6, thence N. 24 degrees W. for 11.00 ch's, thence N. 7 degrees W. for 17.50 ch's, thence N. 1 degree east for 9.00 chains, thence N. 10½ degrees east for 8.90 chains, thence N. 17 degrees east for 12.46 ch's to meander corner No. 7, thence N. 14 degrees E. for 4.13 ch's to meander cor. No. 8, thence N. 31 degrees east for 10.00 chains, thence N. 61 degrees east for 10.00 chains, thence N. 78¼ degrees east for 7.37 chains, thence S. 86¼ degrees east for 16.00 chains, thence S. 75 degrees for 16.00 chains, thence S. 83 degrees east for 20.00 ch's, thence east for 5.00 ch's, thence S. 81 degrees east for 3.50 ch's to meander cor. No. 9, thence S. 81 degrees east for 16.00 chains, thence S. 76 degrees east for 10.92 chains, thence S. 69 degrees east for 20.00 ch's to meander cor. No. 10, thence S. 77½ degrees east for 35.74 chains, more or less, to where the line intersects the Iowa meander of the Missouri river in 1851.

8 V. In 1851 the course, current, bed, and main channel of said river began to change at several places between the termini of the two meander lines above described. At or near the northeast corner of the northwest quarter of the northeast quarter of said section twenty-two, in Iowa, the current of the river set strongly against its south bank and cut out the same, and at the same time new land was formed against the opposite north bank. This process continued from year to year until 1877, when the north bank of said river ran through the south half of sections twenty-one and twenty-two, and at that time at or near the southwest corner of said section twenty-one the river turned suddenly northeasterly. While the above-described change in the course, current, bed, and main channel of the river was going on another was also taking place along the north line of sections twenty and twenty-one, where the current set strongly against the north bank and cut out the same, and at the same time new land was formed against the south bank, so that in 1877 the said river had changed its bed from its place in 1851 to and over what was sections one, two, and three, originally in Nebraska, the south bank being along the middle, east, and west line thereof and the north bank being along the north line thereof. A third change was at the same time going on at the northwest corner of the southwest quarter of the southwest quarter of section two, in Nebraska, where the river swept against the west bank, cutting into the land down to or near the northeast corner of section fifteen, in Nebraska, and this process continued until 1877, when the said east bank ran near the east line of said section twenty, in Iowa, and the west bank ran through the southeast quarter of section three and the east half of section ten, in Nebraska. At or near the southeast corner of section ten, in Nebraska, the river struck across to and against its east bank, cutting into the same and forming land on the Nebraska shore, and this also continued until

9 1877. In that year changes in the river at the point above mentioned, where, in section twenty-one, in Iowa, it turned north, and at the point above mentioned, where, in section ten, in Nebraska, it was working east, had reached a stage where the distance between said points was very short, and suddenly the

waters of the river broke through the intervening land and there formed the main channel of the river, through which it has ever since flowed. Since that time the current of said river through the south part of section twenty-two, in Iowa, has set strongly against the south bank, cutting the same away and forming new land against the north bank, so that at this time the north bank runs along or near the quarter-section east and west line of the north half of section twenty-eight, in Iowa.

Hereto annexed is a map showing as accurately as possible the course of said river in 1851, 1856, 1867, and at the present time.

VI. The Missouri is a river of the first class, navigable by steamers of heavy tonnage. It flows through lands of soft sand loam, and its banks are not protected by rocks or the roots of trees or other matter against the operation of the waters. Its current is rapid, flowing from five to ten miles an hour. Its course is very circuitous, every few miles changing from one direction to another. The new land at the several places above mentioned was formed by imperceptible degrees and by the operation of the current and waters of the river washing and depositing against the banks earth, sand, and other material, and became and is high and dry and above high-water mark. The main channel of the said river before the sudden change in its course, which took place in 1877, ran as follows:

Beginning at the northeast corner of section 22, in Iowa, thence southwesterly to the southwest corner of said section, thence westerly near the south line of section 21 to or near the southwest corner of said section 21, thence northerly through the southwest quarter of said section 21, thence through the middle of the north half of said section, thence northerly across the bed of said river as the same ran in 1851 and 1856 through the southwest quarter of section 1, in Nebraska; thence westerly through the north half of said section 2 and the southwest quarter of section 2, and thence southwesterly through the southeast quarter of section 3 and the east half of section 10.

Having regard to the changes in the said river and the manner and cause thereof, your orator submits that the line last above described is the true boundary between said States.

VII. Not only from 1877, when the waters of said river broke through from one place to the other, as above stated, until about three years since, but during the whole period of the said changes, the lands above described were wild, uncultivated, and of little value and did not attract public attention. Within the past three years inhabitants of the State of Nebraska entered upon the said lands and began to make large and valuable improvements thereon, claiming title to the new lands above described on the ground that the same were accretions formed to the lands of which they held legal title derived to them from the Government. About two years ago the authorities of the State of Iowa put forward the claim that all of said lands in said sections sixteen, seventeen, twenty, twenty-one, and twenty-three, according to the Iowa surveys, are within its boundaries, sovereignty, and jurisdiction, and particularly they have

established and do maintain a large, active, and vigorous system of police, and levy upon said lands taxes for the support of their municipal and State government.

VIII. Nevertheless, your orator has ever claimed and insisted that the said lands are within its limits, as defined in its constitution and recognized by the act of Congress admitting it into
11 the Union. The line dividing the said States in the region hereinbefore described has never been settled, defined, or established. Many evil-disposed persons have settled upon parts of said lands and, on account of the doubts excited by the disputes as to the boundary between them, set at defiance the laws and authorities of both States—that is to say, when the officers of the State of Iowa undertake to enforce its laws against said persons they insist that they are within the jurisdiction and sovereignty of the State of Nebraska, and, on the other hand, when the officers of the State of Nebraska undertake to enforce its laws against said persons they insist that they are within the jurisdiction and sovereignty of the State of Iowa, so that it has come about that a state of lawlessness and violence exists in said region.

The said lands are adjacent to the city of Omaha, and various large industries are being established and built thereon, over which each State claims jurisdiction.

And your orator well hoped that said defendant would withdraw its pretensions to jurisdiction and sovereignty over the said lands originally surveyed in sections 16, 17, 21, 22, 23, and 28, as in equity and good conscience it ought to have done, but it refuses to desist from its unjust and illegal pretenses and claims in that behalf.

All which actings, doings, and refusals are contrary to equity and good conscience and tend to the manifest wrong, injury, and oppression of your orator in the premises.

Wherefore your orator prays the equitable intervention of your honors, and that the said defendant, The State of Iowa, answer the matters set forth and alleged in this your orator's bill, and that the boundary between your orator and the State of Iowa may, by the order and decree of this honorable court, be ascertained and established, and that the right and jurisdiction and sovereignty of the parties hereto may be established and confirmed between them, and that your orator be quieted in the full and free enjoyment of the title, jurisdiction, and sovereignty over so much of the said
12 lands as shall by the said decree be found and adjudged to be within the territorial limits of your orator, and that your orator may have such other and further relief in the premises as to this honorable court shall seem meet and consistent with equity and good conscience.

May it please your honors to grant unto your orator the usual writ of subpœna, issuing out of this honorable court and under the seal thereof and directed to the said defendant, The State of Iowa, commanding it that, at a day therein to be inserted, it be and appear before your honors in this honorable court, then and there to answer the premises and stand to, perform, and abide such order and decree as to your honors shall seem meet and equitable.

And your orator will ever pray, etc.

WILLIAM LEESE,
Attorney General of Nebraska.

J. M. WOOLWORTH,
C. J. GREEN,
Of Counsel.

(Map attached to original bill omitted in printing.)

(Endorsed:) Supreme Court U. S. 1890, October term. No. 4. Original. The State of Nebraska, complainant, *vs.* The State of Iowa. Bill of complaint. Filed Oct'r 21, 1890.

13 And afterwards, to wit, on the first day of November, A. D. 1890, a subpœna and certified copies of bill of complaint were issued to the marshal of the Supreme Court of the United States.

And afterwards, to wit, on the 26th day of November, A. D. 1891, the subpœna, with proof of service of same endorsed thereon, was filed in words and figures following, to wit:

14 THE UNITED STATES OF AMERICA, *ss*:

The President of the United States of America to the State of Iowa, Greeting:

[Seal of Supreme Court U. S.]

For certain causes offered before the Supreme Court of the United States, having jurisdiction in equity, you are hereby commanded that, laying all other matters aside and notwithstanding any excuse, you be and appear before the said Supreme Court, holding jurisdiction in equity, on the third Monday of January next, at the city of Washington, in the District of Columbia, being the seat of the National Government of the United States, to answer unto a bill of complaint of the State of Nebraska in the said court exhibited against you.

Hereof your are not to fail at your peril.

Witness the Honorable Melville W. Fuller, Chief Justice of the said Supreme Court, at the city of Washington, the 1st day of November, A. D. 1890.

JAMES H. McKENNEY,
Clerk of the Supreme Court of the United States.

Supreme Court of the United States.

OFFICE OF THE MARSHAL,
WASHINGTON, D. C., *Nov.* 11, 1890.

I, J. M. Wright, marshal of the Supreme Court of the
15 United States, do hereby authorize and deputize Charles H. Marple to serve the within writ and make due return thereof.

J. M. WRIGHT, *Marshal.*

NOVEMBER 22ND, 1890.

Came to hand the 14th day of November, 1890.

And executed the 20th day of November, 1890, by making known contents hereof to John Y. Stone, attorney general of the State of Iowa, by reading to him this process, by showing seal, and by delivering to him a copy of the bill in this cause and a copy of this process.

And executed in full this 21st day of November, 1890, by making known the contents hereof to Horace Boies, governor of the said State of Iowa, by reading to him this process, by showing seal, and by delivering to him a copy of the bill in this cause and a copy of this process.

CHARLES H. MARPLE.

(Endorsed:) Supreme Court U. S. 1890, October term. No. 4. Original. The State of Nebraska, complainant, *vs.* The State of Iowa. Subpœna and proof of service. Filed Nov. 26, 1890.

16 And afterwards, to wit, on the 1st day of April, A. D. 1891, the following entry appears of record, viz:

THE STATE OF NEBRASKA, Complainant,
vs.
THE STATE OF IOWA. } 4. Original.

On motion of Mr. Felix A. Reeve, in behalf of counsel, leave is hereby granted to file herein stipulations of counsel as to filing pleadings, and also the answer of the defendant.

And on the same day, to wit, on the 1st day of April, A. D. 1891, stipulations of counsel as to filing pleadings were filed in the words and figures following, to wit:

17 In the Supreme Court of the United States.

THE STATE OF NEBRASKA, Complainant,
vs.
THE STATE OF IOWA, Respondent. } Stipulation.

It is hereby agreed by the counsel for the parties to the above suit that the respondent may have until the 25th day of March, 1891, to file its answer to the complainant's bill herein.

It is further agreed that should the respondent file a general answer herein the complainant may immediately file its replication hereto; but should it file a cross-bill or other pleading, then the complainant shall have such day as it may desire, within the rules of the court, to file its answer or replication.

STATE OF NEBRASKA,
By J. M. WOOLWORTH AND
C. J. GREEN,
Its Attorneys & Counsel.
STATE OF IOWA,
By JNO. Y. STONE,
Att'y Gen'l of State, its Attorney.

(Endorsed:) Supreme Court U. S. 1890, October term. No. 4. Orig'l. The State of Nebraska, complainant, *vs.* The State of Iowa. Stipulation that respondent have until March 25, 1891, to file answer & as to filing replication or cross-bill. Filed April 1st, 1891.

18 STATE OF IOWA:

OFFICE OF ATTORNEY GENERAL, DES MOINES.

In the Supreme Court of the United States.

THE STATE OF NEBRASKA
vs.
THE STATE OF IOWA.

Stipulation.

It is agreed by the parties to this cause that the defendant shall have until the 5th of April, 1891, to file its answer and cross-bill, should it desire to file the latter. It is further agreed that in case the plaintiff should so desire it may file its replication immediately upon the filing of the answer. It is also agreed that the plaintiff, should it so desire, may immediately file its answer to the cross-bill, should there be one and it should desire to so plead.

J. M. WOOLWORTH,
C. J. GREEN,
Counsel for Plaintiff.
JNO. Y. STONE,
Counsel for Defendant.

(Endorsed:) Supreme Court U. S. 1890, October term. No. 4. Orig'l. The State of Nebraska, compl't, *vs.* The State of Iowa. Stipulation as to filing answer, cross-bill, and replication. Filed April 1, 1891.

19 And on the same day, to wit, on the first day of April, A. D. 1891, the answer of the State of Iowa to the bill of complaint was filed in the words and figures following, viz:

20 In the Supreme Court of the United States.

THE STATE OF NEBRASKA
vs.
THE STATE OF IOWA. } In Equity.

The Answer of The State of Iowa, Defendant, to the Bill of Complaint of The State of Nebraska.

The defendant, saving and reserving unto itself the benefit of all exceptions to the errors and imperfections in said bill contained, for answer to so much thereof as it is advised it is necessary and material for it to answer unto does aver and say:

1. That it admits that in the year 1846 the State of Iowa was

admitted into the Union with boundaries as alleged in the bill; that in 1851 the United States, by its surveyors, marked the line of the left bank of the Missouri river as it then ran, as alleged in the bill, and defendant is not prepared to deny that the lines of said river were substantially the same in 1851 that they were in 1846. Defendant states that the line of the meander of 1851 as alleged in the bill is erroneous and deficient in certain minor particulars within the limits described in said bill, to wit, from the point where the east line of section 29, township 75 north, range 44 west, of the 5th principal meridian, which point is identical with the intersection of the said meander line with the present bank of the Missouri river, to a point where the north line of section 22, in said township and range, intersected the meander line of 1851, which point is erroneously and by mistake described in the bill as the point
21 where the said north line of section 22 touched the west bank of said river. Defendant alleges that the limits which it supposes the plaintiff intended to describe in the bill are herein correctly described, and that the line as described by the field-notes filed and approved in the General Land Office is as follows: Commencing at meander post No. 4, 7.74 chains west of the southwest corner of section 21, township 75 north, range 44 west, of the 5th principal meridian, State of Iowa, of the Iowa meander of the Missouri river in 1851, thence along said meander line as follows: south 9 degrees east for 2.88 chains; thence south 17 degrees east for 20.70 chains; thence south 20 degrees east for 4.50 chains to meander post No. 3; thence south 8 degrees east for 2.50 chains to the line of sections 28 and 29 and to the present west bank of the Missouri river; again commencing at said meander post No. 4, thence north 22 degrees west for 3 chains; thence north 13 degrees west for 48 chains; thence north 2 degrees east for 22 chains; thence north 20 degrees east for 8 chains; thence north 55 degrees east for 1.43 chains to meander post No. 5 and to the line between sections 17 and 20; thence north 63 degrees east for 1.50 chains; thence north 83 degrees east for 7.50 chains; thence south 83 degrees east for 3 chains; thence south 80 degrees east for 3.10 chains to meander post No. 6, 87 links north of the corner of sections 16, 17, and 21; thence south 71 degrees east for 2.68 chains to meander post No. 7 and to the line of sections 16 and 21; thence south 79 degrees and 50 min-
22 utes east for 54 chains; thence north 85 degrees east for 4.50 chains; thence east for 15 chains; thence north 87 degrees east for 5.25 chains to meander post No. 8 and to the line of sections 21 and 22; thence north 77 degrees east for 34 chains to meander post No. 9 and to the line of sections 15 and 22.

2. The defendant also admits that in the year 1867 the State of Nebraska was admitted into the Union, and that its constitution and the act of Congress admitting it described as its boundaries the line given in paragraph 3 of the bill, but the defendant expressly alleges and claims that the admission of Nebraska into the Union and fixing its boundaries as aforesaid would and did not change the then existing boundaries and sovereignty of the defendant, The State of Iowa.

3. The defendant also admits that in 1856 the right bank of the Missouri river was meandered by the United States by its surveyors substantially in the manner and between the lines indicated in the line described in the bill.

4. The defendant denies each and all statements made in the fifth, sixth, seventh, and eighth paragraphs of plaintiff's bill except as *he* hereinafter specifically admitted, and alleges the fact to be that the said Missouri river did at various times between the time when Iowa was admitted into the Union and the beginning of this suit change its bed, course, and direction of flow, but that all of said changes were made rapidly, appreciably, and perceptibly and by avulsion; that the bed and position of the river did not
23 change by imperceptible erosion and accretion as alleged in plaintiff's bill; that ground was at times added to both banks, but that said subtractions and additions, removals and increases, were made by rapid, perceptible, and measurable changes in the bed and course of the river.

5. Further answering, and by way of additional defence, the defendant says that the Missouri river is a river of the first class; that the amount of water which flows down it is very large and varies greatly in amount; that within the limits and termini of the meander line described in the bill it flows through a plain bounded by bluffs, which are four or five miles apart. The whole of the plain between said bluffs is composed of soft, friable, sandy loam, not protected against the action of the water and very easily susceptible thereto. It readily and rapidly yields to the force of a current and the banks formed of it afford a very slight resistance to the changes that the rapidly flowing river is constantly making. This plain is also level, being as low at the base of the bluffs on either side as it is in the centre, and therefore the force of gravity does not help to confine the river to any certain part of it. The current of the Missouri river is very rapid, varying at different places and with the time of year and the stage of the water from five to ten miles an hour. The river is subject to annually and semi-annually recurring freshets, usually occurring in June and April, popularly known as the "June rises" and "April rises," during which, for a few weeks, the amount of water flowing down the river is
24 increased to many times its ordinary and usual volume and the river leaves its accustomed channel and spreads over a large part of the plain. During these freshets the process of change is very rapid, especially while the water is subsiding. While the water is up over the banks it frequently cuts through the necks of bends, entirely forsaking its former channel, and while it is subsiding it cuts away its banks on one side and builds them up on the other as rapidly as ten to one hundred and fifty feet within twenty-four hours.

6. On account of the facts above and hereinafter stated, the defendant shows to the court that the bed in which the Missouri river flows during the periods of low water of each year is altogether uncertain, and that its real bed is the whole of the plain before described. It is liable to flow in any portion of said plain,

and has, in fact, within the memory of man, flowed over nearly every portion of it, except a few hundred acres in the northwestern angle of the Iowa meander line, and, in view of the history and character of said river and plain, will probably do so again within as short a period.

7. Within the limits of the termini aforesaid, the average change of the ordinary bed of the stream has been over three hundred feet a year since the admission of Iowa into the Union. The defendant believes and alleges the fact to be that the greater portion of said change in each year took place during the subsidence
25 of the water during the "June rises" and "April rises" within a few weeks, and sometimes a few days in each year. The changes were so rapid that the river frequently cut away one bank and added to the other over one hundred and fifty feet in a single day and one hundred feet in twelve hours, and they were therefore perceptible, appreciable, and measurable. Strips of territory hundreds of feet wide and containing many acres, which at the beginning of the freshet were covered by the waters of the river, would within a few weeks or days be filled with earth and soil, and at the subsidence of the waters at the end of this short period appear as dry ground. Large tracts of ground covering many acres in extent were cut away by the river in a few days, and the current would flow where these tracts had been, and later in the same year the waters would rapidly recede, depositing earth, and the identical tracts would again become dry ground. At various points within the limits of the termini aforesaid, land which was on the Nebraska side of the river was cut away rapidly, and the current flowed where said land had been, and then during the next freshet the river changed its course, leaving the said land far removed from the new bed of the stream.

8. And the defendant alleges that the changes and facts above set forth are characteristic of the Missouri river between the two States, and that similar phenom-a have frequently taken
26 place, and may, from the character and history of said river and plain, be expected to take place in the future.

9. On account of the above facts the changes of the bed of the Missouri river were so rapid that they were perceptible, appreciable, and measurable.

10. Notwithstanding the wanderings of the Missouri river within the limits and territory described, the land affected thereby, the surface of which was eroded and washed away and then built up again, can be identified by metes and bounds as being the same land and in the same position. The said land was surveyed at the time the 1851 line was meandered by the United States and it has been again surveyed in recent years, after having been washed away and replaced on the other side of the river, and the original lines, corners, and tracts established as before. The changes above described—the erosions and displacements—were only of the surface and soil to a depth of not more than a few feet.

11. The defendant further alleges that all the land claimed by the plaintiff lying south and east of the Iowa meander line of 1851

made and formed since Iowa was admitted into the Union was made by the rapid process of avulsion hereinbefore described and not by accretion; that within the northwestern angle of the said Iowa meander line there lies a few hundred acres of land which has not been changed since 1846, but which lies in place as it then did.

27 12. That when Iowa was admitted into the Union the bed of said river covered all or about all the land lying between the Iowa meander line of 1851 and the Nebraska meander line of 1856, and since the last-mentioned date the bed of the river between the point where the river suddenly changed its course in 1877 has, from certain artificial causes, deepened along the Nebraska meander line and the waters receded from the Iowa meander, leaving the strip now lying between the Iowa meander and the present bed of the river dry ground.

13. Defendant alleges that the boundary line between said States established upon the admission of Iowa into the Union was the thread of the stream of said river as it then flowed which is identical with the centre line of the area now lying between the two meander lines and running parallel therewith, and the plaintiff alleges this to be the boundary now. Said centre line was and is, the defendant alleges, as follows: Commencing at a point midway between the meander lines of 1851 and 1856 at a point 200 feet, more or less, north of the quarter-section corner on the north line of section twenty-two, township seventy-five north, range forty-four west, of the 5th P. M., and running thence west 2,640 feet or to a point 200 feet, more or less, north of the northwest corner of said section; thence north 82½ degrees west to a point 860 feet, more or less, north of the northwest corner of section 21; thence west 1,980 feet;

28 thence south 3,500 feet or to the east and west open or quarter-section line through section 20; thence south 18 degrees and 30 minutes east to a point 1,080 feet, more or less, west of the southwest quarter of section 21, township 75, range 44, and on the south line of section 20; thence south 11 degrees east to the Missouri river.

Also commencing at the point first designated, viz., 20 feet, more or less, north of the quarter-section corner on the north line of section 22, township 75, range 44, and running thence north 58 degrees east or to a point 1,840 feet north of the northeast corner of section 22 aforesaid.

14. Defendant further alleges that the true course of the Missouri river as it actually flowed in 1877, immediately prior to the sudden cut-off referred to in plaintiff's bill through the west part of section 21, township 75 N., range 44 west, of 5th P. M., and sections 1, 23, 10, and 14, in township 15 north, range 13 east, of 6th P. M., was as follows: The right bank of the river, commencing at the point where the new channel departed from the old and running north, was as follows: Commencing at a stake on said bank 115 feet west of the centre of said section 21, township 75, range 44, and running thence south 25 degrees west 1,456½ feet to the south line of the northeast ¼ of the southwest ¼ of section 21 aforesaid, thence south

10 degrees east 138 feet to a point which bears from the
29 southwest corner of section 21 north 400 feet, north 62½ degrees east 600 feet, north 58 degrees and 5 minutes east 400 feet, north 74½ degrees east 1,071 feet. Again, from above point of beginning running northerly and along said right bank of the river at the time of the cut-off of 1877 north 33 degrees east 783 feet, thence 33 degrees 28 minutes east 1,711 feet, thence north 4 degrees and 10 minutes east 355 feet, thence north 9 degrees and 5 minutes east 883½ feet, thence north 18 degrees 45 minutes east 658½ feet, thence north 13 degrees 50 minutes east 881 feet, thence north 3 degrees 20 minutes east 614 feet, thence north 8 degrees west 387 feet, thence north 2 degrees east 198 feet, thence north 13 degrees 58 minutes west 664 feet, thence north 43 degrees 58 minutes west 363½ feet, thence north 40 degrees 30 minutes west 718½ feet, thence north 63 degrees 58 minutes west 253½ feet, thence north 83 degrees west 221½ feet, thence south 68 degrees 5 minutes west 517 feet, thence south 77 degrees 55 minutes west 553 feet, thence north 66 degrees 35 minutes west 346 feet, thence north 57 degrees 25 minutes west 461½ feet, thence north 83 degrees 58 minutes west 685 feet, thence south 77 degrees 2 minutes west 612½ feet to a point 1,564 feet north of the centre of section 2, township 15, range 13 east; thence south 55 degrees 5 minutes west 300 feet, thence south 33 degrees and 15 minutes west 327½ feet, thence south 52 degrees and 48 minutes west 230 feet, thence south 75 degrees 15 minutes west 220 feet, thence
30 south 84 degrees 32 minutes west 931½ feet, thence south 59 degrees 20 minutes west 974 feet, thence south 60 degrees 35 minutes west 472 feet, thence south 63 degrees 48 minutes west 500 feet, thence south 4 degrees 5 minutes west 489 feet, thence south 11 degrees west 408½ feet, thence south 4 degrees 50 minutes west 575 feet, thence south 10 degrees and 28 minutes west 761 feet, thence south 9 degrees 5 minutes west 755 feet, thence south 2 degrees 25 minutes west 622 feet, thence south 15 degrees 52 minutes west 750 feet, thence south 2 degrees 50 minutes east 1,000 feet, thence south 10 degrees 30 minutes east 700 feet, thence south 13 degrees and 42 minutes east 726 feet, thence south 36 degrees 32 minutes east 532½ feet, thence south 50 degrees 50 minutes east 400 feet, thence south 64 degrees 45 minutes east 500 feet, thence south 54 degrees east 400 feet, thence south 30 degrees east 796 feet, thence south 18 degrees 44 minutes west 680 feet, thence south 18 degrees 45 minutes west 400 feet, thence south 1 degree 40 minutes east 778 feet, thence south 19 degrees to the right bank of the present channel.

The left bank of said portion of the river at the same time was as follows: The point of beginning bears as follows: From the southwest corner of section 21, township 75, range 44 west of the 5th P. M., north 400 feet, thence north 62½ degrees east 600 feet, north 58 degrees 5 minutes east 130 feet to said point of beginning, thence north 6 degrees 45 minutes west 567½ feet, thence north 12 degrees
40 minutes east 540 feet, thence north 25 degrees 45 min-
31 utes east 300 feet, thence north 33 degrees 45 minutes east

613½ feet, thence north 19 degrees 32 minutes east 699 feet, thence north 28 degrees 15 minutes east 1,000 feet, thence north 33 degrees 18 minutes east 500 feet, thence north 20 degrees 55 minutes east 415½ feet, thence north 22 degrees 52 minutes east 315 feet, thence north 17 degrees 50 minutes east 2,057 feet, thence north 3 degrees 45 minutes east 524 feet, thence north 24 degrees 55 minutes west 669 feet, thence north 40 degrees 55 minutes west 252½ feet, thence north 57 degrees 30 minutes west 1,054 feet, thence south 74 degrees 55 minutes west 1,113 feet, thence south 89 degrees 35 minutes west 593½ feet, thence south 72 degrees 50 minutes west 509 feet, thence south 59 degrees 12 minutes west 1,081½ feet, thence south 52 degrees 2 minutes west 473½ feet, thence south 56 degrees 45 minutes west 360 feet, thence south 60 degrees 13 minutes west 360 feet, thence south 7 degrees 53 minutes west or in a right line to the northeast corner of the southeast ¼ of the northwest ¼ of section 10, township 15 north, range 13 east, when produced and located; thence south 1,320 feet to southeast corner of above tract; thence south 23 degrees east 1,434 feet to forty-acre line, produced; thence south 55 degrees east 1,120 feet; thence southeasterly to meander post No. 4, on the Iowa meander line, 7.74 chains west of the southeast corner of section 20, township 75, range 44.

The thread of the stream of the said portion of the river at the same time was as follows:

32 Commencing at a point on the south line of section 20, township 75, range 44, 1,160 feet west of its southeast corner and running thence south 15 degrees 20 minutes west 920 feet, thence south 5 degrees west 960 feet, thence south 19 degrees 35 minutes east to the Missouri river. Again, commencing at point above described and running north 32 degrees west 800 feet, thence north 47 degrees 50 minutes west to south line of northeast quarter of southeast quarter of section 10, township 15, range thirteen east; thence north 11 degrees west to east and west open or half-section line through section 10, thence north 4 degrees 20 minutes east to the north line of section 10 aforesaid, thence north 8 degrees 40 minutes east 2,100 feet, thence north 60 degrees 15 minutes east or to the centre of the southeast quarter of the northwest quarter of section 2, township 15, range 13 east; thence east to the centre of the southwest quarter of the northwest quarter of section 1, township 15 north, range 13 east; thence south 12½ degrees east to the south line of the northwest quarter of the southwest quarter of section 1, township 15 north, range 13 east; thence south 17 degrees 50 minutes west to the southeast corner of the northeast quarter of the northwest quarter of section 21, township 75, range 44; thence south 26 degrees 34 minutes west to the northeast corner of the southwest quarter of the southwest quarter of section 21, township 75,
33 range 44; thence south 26 degrees and 34 minutes east to the Missouri river.

From the point of departure of the new from the old bed of the river before referred to and running east the line of the right bank of the river at the time of the cut-off of 1877, through sections 21 and 22, township 75, range 44 W., was as follows: The commencement

point was as follows: From a point on said bank 400 feet north of the southwest quarter of section 21, township 75, range 44 west of the 5th P. M., thence 62¼ degrees east 600 feet, thence north 58 degrees 5 minutes east 400 feet, thence north 74½ degrees east 1,071 feet to the said point of beginning, thence 74½ degrees east 279 feet, thence 78 degrees 50 minutes east 900 feet, thence north 74 degrees 55 minutes east 700 feet, thence north 65 degrees east 1,706 feet to the intersection of the east line of sections 21 and 22 to a point on said line 284⅔ feet south of the quarter-section corner of sections 21 and 22, thence north 49½ degrees east 440 feet, thence north 66 degrees east 400 feet, thence north 56 degrees 50 minutes east 742½ feet, thence north 53¼ degrees east 500 feet, thence north 45½ degrees east 300 feet, thence north 80 degrees 32 minutes east 713 feet, thence north 84 degrees 45 minutes east 752½ feet, thence north 24 degrees 38 minutes east 466 feet, thence north 34 degrees 55 minutes east 750 feet, more or less, to the north line of section 22. All of the above lines
34 referred to in this answer are shown on the map marked Exhibit "A," annexed hereto and made a part hereof.

15. The defendant admits that it claims jurisdiction over the land in controversy, and alleges that it maintains authority and government thereon and collects taxes therefrom and maintains order thereon, and has ever asserted its authority and sovereignty over the same since the State of Iowa was admitted into the Union.

And having thus fully made answer to said bill, this defendant prays to be herein dismissed with costs.

JNO. Y. STONE,
Attorney General of Iowa.

(Endorsed:) Supreme Court U. S. 1890, October term. No. 4. Orig'l. The State of Nebraska, complainant, *vs.* The State of Iowa. Answer of State of Iowa to bill of complaint. Filed April 1, 1891.

35 And afterwards, to wit, on the 6th day of April, A. D. 1891, the following entry appears of record, viz:

THE STATE OF NEBRASKA, Complainant,
vs.
THE STATE OF IOWA. } 4. Original.

On motion of Mr. Felix A. Reeve, in behalf of counsel for the defendant, leave is hereby granted to file a cross-bill herein.

And on the same day, to wit, on the 6th day of April, A. D. 1891, the motion for leave to file cross-bill and the cross-bill of the State of Iowa were filed in words and figures following, viz:

36 In the Supreme Court of the United States.

THE STATE OF NEBRASKA
vs.
THE STATE OF IOWA.

Motion for Leave to File a Cross-Bill.

The defendant shows to the court:

This is a suit in equity by the State of Nebraska against the State of Iowa, praying the establishment of a boundary line between the two States; that as the pleadings stand the defendant cannot receive the relief it is entitled to; that as shown in the annexed cross-bill the State of Iowa is entitled to affirmative relief, namely, the establishing of a boundary at a place different from the one prayed by the State of Nebraska.

The State of Iowa therefore moves the court for leave to file the cross-bill aforesaid.

JNO. Y. STONE,
Att'y Gen'l for Iowa.

37 Supreme Court of the United States.

STATE OF IOWA
vs.
STATE OF NEBRASKA. } In Equity.

To the honorable Chief Justice and associate justices of the Supreme Court of the United States:

The State of Iowa, leave of court therefore being first granted, brings and files this its cross-bill against the State of Nebraska, and thereupon complains and says:

1. That on the — day of ——, 1890, the respondent herein, The State of Nebraska, exhibited in this court its bill of complaint against the complainant herein, seeking the establishment of a boundary between the two States between two certain points on the plain of the Missouri river, setting out a line alleged to be the boundary line of the west end of the State of Iowa when it was admitted into the Union, in 1846; and setting out also a line alleged to be the meander line made by the General Government in 1851 and alleged to be the same as when the State of Iowa was admitted into the Union; and also setting out the admission of the State of Nebraska into the Union in 1867 upon certain boundary lines therein described; also setting out an alleged meander line of the west bank of the Missouri made by the General Government in 1856; also containing averments as to the changes of the course, bed, current,

38 and main channel of said river and the changes therein between the termini of the two meander lines above mentioned, which lines, it is alleged, have in times past constituted the lines of the banks of said river, that of 1851 the east bank and that of 1856 the west bank; also describing certain changes in the bed, course, current, banks, and channel of said river between 1851 and

1877, and averring that lands have been formed and made by accretion during this period against the Nebraska shore, and that such changes as have been made were by imperceptible degrees along the line dividing the two States between the termini aforesaid; and it is prayed in said bill as follows:

"Wherefore your orator prays the equitable intervention of your honors, and that the said defendant, The State of Iowa, answer the matters set forth and alleged in this your orator's bill, and that the boundary between your orator and the State of Iowa by the order and decree of this honorable court be ascertained and established, and that the right and jurisdiction and sovereignty of the parties hereto may be established and confirmed between them, and that your orator be quieted in the full and free enjoyment of the title, jurisdiction, and sovereignty over so much of the said lands as shall by the said decree be found and adjudged to be within the territorial limits of your orator, and that your orator may have such other and further relief in the premises as to this honorable court shall seem meet and consistent with equity and good conscience."

Complainant herein further alleges that in said bill the
39 issuance of a subpœna against the State of Iowa was prayed and said subpœna issued and served upon said State of Iowa, commanding it to appear and answer said bill by the 25th day of January, 1891, which time was, by stipulation, afterwards extended to April 5th, 1891.

2. And the complainant in this its cross-bill further alleges that in the year 1846 the State of Iowa was admitted into the Union, with boundaries as follows:

"Beginning in the middle of the main channel of the Mississippi river at a point due east of the middle of the mouth of the main channel of the Des Moines river, thence up the middle of the main channel of the said Des Moines river to a point on said river where the northern boundary line of the State of Missouri as established by the constitution of that State adopted June 12th, 1820, crosses the said middle of the main channel of the said Des Moines river; thence westwardly along the said northern boundary line of the State of Missouri as established at the time aforesaid until an extension of said line intersect- the channel of the main line of the Missouri river; then up the middle of the main channel of the said Missouri river to a point opposite the middle of the main channel of the Big Sioux river according to Nicolett's map; thence up the main channel of the Big Sioux river according to said map until it
is intersected by the parallel of 43 degrees and 30 minutes
40 north latitude; thence east along said parallel of 43 degrees and 30 minutes until said parallel intersects the middle of the main channel of the Mississippi; thence down the middle of the main channel of said Mississippi river to the place of beginning.

3. In 1851 the United States, by its surveyors, ran, marked, and made field-notes of said plats of the meander line of the west bank of the Missouri river, which plats and field-notes were duly returned to the surveyor general, who filed the same in the General Land Office, where they were duly approved. The said field-notes de-

scribed the said meander line from the point where the said meander line intersects with the east line of section 29, in township 75 north, range 44 west, of the fifth principal meridian, which point is identical with the intersection of the said meander line with the present bank of the Missouri river to a point where the north line of section 22, in said township and range, intersects the said meander line of 1851, as follows:

Commencing at meander post number 4, 7.74 chains west of the southwest corner of section 21, township 75 north, range
41 44 west, of the 5th principal meridian of the State of Iowa, of the Iowa meander of the Missouri river in 1851, thence along said meander line as follows: South 9 degrees east for 2.88 chains; thence south 17 degrees east for 20.70 chains; thence south 20 degrees east for 4.50 chains to meander post number 3; thence south 8 degrees east for 2.50 chains to the line of sections 28 and 29 and to the present west bank of the Missouri. Again, commencing at meander post number 4, thence north 22 degrees west for 3 chains; thence north 13 degrees west for 48 chains; thence north 2 degrees east for 22 chains; thence north 20 degrees east for 8 chains; thence north 65 degrees east for 1.43 chains to meander post number 5 and to the line between sections 17 & 20; thence north 63 degrees east for 1.50 chains; thence north 83 degrees east for 7.50 chains; thence south 83 degrees east for 3 chains; thence south 80 degrees east for 3.10 chains to meander post number 6, 87 links north of the corner of sections 16, 17, and 21; thence south 71 degrees east for 2.68 chains to meander post number 7 and to the line of sections 17 and 21; thence south 79 degrees and 50 minutes east for 54
42 chains; thence north 85 degrees east for 4.50 chains; thence east for 15 chains; thence north 87 degrees east for 5.25 chains to meander post number 8 and to the line of sections 21 and 22; thence north 77 degrees east for 34 chains to meander post number 9 and to the line of sections 15 and 22.

4. In the year 1867 the State of Nebraska was admitted into the Union, with boundaries described as follows:

"Commencing at a point formed by the intersection of the west boundary of the State of Missouri with the 40th degree north latitude, extending thence west along the 40th degree of said north latitude to a point formed by its intersection with the 25th degree of longitude west from Washington; thence north along said 25th degree of longitude to a point formed by its intersection with the 41st degree of north latitude; thence west along said 41st degree of north latitude to a point formed by its intersection with the 27th degree of *of* longitude west from Washington; thence north along said 27th degree of west longitude to a point formed by its intersection with the 43rd degree of north latitude; thence east along said
43 43rd degree of north latitude to the Keya Paha river; thence down the middle of the channel of said river with its meander to its junction with the Niobrara river and following the meandering thereof to its junction with the Missouri river; thence down the middle of the channel of the said Missouri river and following the meandering thereof to the place of beginning."

5. In 1856 the United States, by its surveyors, ran, marked, and made field-notes and plats of the meander line on the west bank of the Missouri river, which plat and field-notes were duly returned to the surveyor general for that State, who filed the same in the General Land Office, where they were duly approved. The said field-notes described the said meander line from a point on the west bank of the said river where the east, north, and south line of section 15, township 13 north, range 13 east, of the *the* 6th principal meridian, State of Nebraska, touches the bank of said river, that point being opposite or nearly opposite the initial of the Iowa meander line above described; thence to the point where the east and west middle lines of section 1, in said township and range, touched the bank of said river, as follows:

Commencing at the meander corner number 5, 12.35 chains east of the southwest corner of section 10, township 15 north, range 13 east, of the 6th principal meridian of the State of Nebraska, of the
44 Nebraska meander of the Missouri river in 1856, thence along said meander line as follows: North 22 degrees west for 10 chains, thence north 32 degrees west for 16.24 chains to the meander corner number 6, thence north 24 degrees west for 11 chains, thence north 7 degrees west for 17.50 chains, thence north 1 degree e-st for 9 chains, thence north 10 degrees and 30 minutes east for 8.90 chains, thence north 17 degrees east for 12.46 chains to meander corner number 7, thence north 14 degrees east for 4.13 chains to meander corner number 8, thence north 31 degrees east for 10 chains, thence north 61 degrees east for 10 chains, thence north 78 degrees east for 7.37 chains, thence south 80 degrees and 15 minutes east for 16 chains, thence south 75 degrees east for 18 chains, thence south 83 degrees east for 20 chains, thence east for 5 chains, thence south 81 degrees east for 16 chains, thence south 76 degrees east for 10.92 chains, thence south 69 degrees east for 20 chains.

6. And your orator believes and alleges the fact to be that the banks of the river between the points aforesaid were in 1846, when the said State of Iowa was admitted into the Union, the same or nearly the same as when the said meander lines were surveyed and run, and that a line drawn approximately midway between the two said meander lines was in 1846 and in 1851 part of the western boundary of the State of Iowa.

That said line is described as follows: Commencing at a point midway between the meander lines of 1851 and 1856 at a
45 point two hundred feet, more or less, north of the quarter-section corner on the north line of section 22, township 75 north, range 44 west, of the 5th principal meridian, and running thence west 2,640 feet or to a point 200 feet, more or less, north of the northwest corner of said section; thence north 82 degrees and 30 minutes west to a point 860 feet, more or less, north of the northwest corner of section 21; thence west 1,980 feet; thence south 3,500 feet or to the east and west open or quarter-section line to section 20; thence south 18 degrees and 30 minutes east to a point 1,080 feet, more or less, west of the southwest quarter of section 21, said township and range, and on the south line of section 20; thence south

11 degrees east to the Missouri river; also commencing at a point first designated, to wit, 200 feet, more or less, north of the quarter-section corner on the north line of section 22, running thence north 58 degrees east to a — 1,840 feet north of the northeast corner of section 22 aforesaid.

7. Your orator further alleges that the Missouri river is a river of the first class, and that the amount of water that flows down it is very large and varies greatly in amount; that within the limits and termini on the meander line described in the bill it flows through a plain bounded by bluffs which are four or five miles apart. The whole of the plain between said bluffs is composed of a soft, friable, sandy loam, not protected against the action of the water and very easily susceptible thereto; it readily and
46 rapidly yields to the force of a current, and the banks formed of it afford a very slight resistance to the changes that the rapidly flowing Missouri is constantly making. This plain is also level, being as low at the base of the bluffs on either side as it is in the centre, and therefore the force of gravity does not help to confine the river to any certain part of it. The current of the Missouri is very rapid, varying at different places and with the time of year and the stage of the water from five to ten miles an hour. The river is subject to annually and semi-annually recurring freshets, usually occurring in June and April, popularly known as the "June rises" and "April rises," during which for a few weeks the amount of water flowing down the river is increased to many times its ordinary and usual volume, and the river leaves its accustomed channel and spreads over a large part of the plain. During these freshets the process of change is very rapid, especially while the water is subsiding. While the water is up over the banks it frequently cuts through the necks of bends, entirely forsaking its former channel, and while it is subsiding it cuts away its banks on one side and builds them up on the other as rapidly as ten to one hundred and fifty feet within twenty-four hours.

8. On account of the facts above and hereinafter stated your orator shows to the court that the bed in which the Missouri river flows during the periods of low water of each year is alto-
47 gether uncertain, and that its real bed is the whole of the plain before described. It is liable to flow in any portion of the said plain, and has in fact within the memory of man flowed over nearly every portion of it except a few hundred acres in the northwestern angle of the Iowa meander line, and, in view of the history and character of said river and plain, will probably do so again within as short a period.

Within the limits of the two termini aforesaid the average change of the ordinary bed of the stream has been over three hundred feet a year since the admission of Iowa into the Union. Your orator believes and alleges the fact to be that the greater portion of said change in each year took place during the subsidence of the water during the "June rises" and "April rises" within a few weeks and sometimes a few days in each year. The changes were so rapid that the river frequently cut away one bank and added to the other over

one hundred and fifty feet in a single day and one hundred feet in twelve hours, and they were therefore perceptible, appreciable, and measurable. Strips of territory hundreds of feet wide and containing many acres which at the beginning of the freshets were covered by the waters of the river would, within a few weeks or days, be filled with earth and soil, and at the subsidence of the waters at the end of this short period appear as dry ground. Large tracts of ground covering many acres of — in extent were cut away by
48 the river in a few days, and the current would flow where these tracts had been, and later in the same year the waters would rapidly recede, depositing earth, and the identical tracts would again become dry ground. At various points within the limits of the termini aforesaid land which was on the Nebraska side of the river was cut away rapidly and the current flowed where said land had been, and then during the next freshet the river changed its course, leaving the said land far removed from the new bed of the stream.

9. And your orator alleges that the changes and facts above set forth are characteristic of the Missouri river between the two States, and that similar phenomena have frequently taken place and may from the character and history of said plain be expected to take place in the future.

10. And your orator further alleges that beginning in 1851 the Missouri river, within the limits aforesaid and in the manner already described, changed its course from year to year, and that in 1877 it had removed southwesterly for more than a mile in the eastern half of its course within the said limits and northerly in the western half for three-quarters of a mile, and that at the beginning of the year 1877 it had formed an "S"-shaped course, having left thousands of acres which in 1851 had been on the left side on the stream on the other or Nebraska side, and in the western part of its course within said limits having changed nearly as much land from the Iowa to the Nebraska side. During 1877 it again left a part of the channel that it then occupied, cutting itself a new one across
49 the neck of the bend and leaving an immense tract — land upon the Nebraska side. The course of the said river in 1851, 1877, and at the present time, the two meander lines aforesaid, and the midway boundary line above referred to are shown in the map hereunto attached.

11. Notwithstanding the wanderings of the Missouri river within the limits of the territory described, the land affected thereby, the surface of which was eroded and washed away and then built up again, can be identified by metes and bounds as being the same land and in the same position. The said land was surveyed at the time the 1851 line was meandered by the United States, and it has been again surveyed in recent years after having been washed away and replaced on the other side of the river, and the original lines, corners, and tracts established as before. The changes above described, the erosions and displacements, were only of the surface and soil to a depth of not more than a few feet.

12. Your orator further alleges that all the land claimed by the respondent herein, The State of Nebraska, lying south and east of

the Iowa meander line of 1861, made and formed since Iowa was admitted into the Union, was made by the rapid processes of avulsion hereinbefore described, and not by accretion; that within the northwestern angle of the said Iowa meander line there lies a few hundred acres of land which has not been changed since 1846, but which lies in place as it then did.

13. That when Iowa was admitted into the Union the bed
50 of said river covered all or about all the land lying between the Iowa meander line of 1851 and the Nebraska line of 1856, and since the last-mentioned date the bed of the river from the point where the river suddenly changed its course in 1877 has from certain artificial causes deepened along the Nebraska meander line and the waters have receded from the Iowa meander, leaving the strip now lying between the Iowa meander and the present bed of the river dry ground.

14. Your orator alleges that the boundary line between said States, established upon the admission of Iowa into the Union, was the thread of the stream of said river as it then flowed, which is identical with the centre line of the area now lying between the two meander lines and running approximately parallel therewith, and your orator alleges this to be the boundary now. Said centre line as it was and is has been heretofore described in paragraph 6 hereof.

15. Your orator alleges that it has ever claimed and exercised jurisdiction and governmental authority over all the territory south and east of said meander line of 1851 within the two termini as aforesaid and of the centre line aforesaid alleged to be the boundary, and that it has and does maintain authority and government therein, collecting taxes and maintaining order, and has ever asserted its authority and sovereignty over said land in controversy since the State of Iowa was admitted into the Union; that the defendant herein, The State of Nebraska, makes an unjust and illegal
51 claim to the sovereignty of said territory and various citizens thereof defy the authority of your orator in and over it, and it is essential for the peace and well-being of the inhabitants of said territory and to the maintainance of the rights of your orator in the premises that the exact location of the boundary line between the States within said limits be established and made known. Said boundary line has never been exactly settled, defined, and established, and therefore the status of a considerable and valuable territory has been and remains uncertain.

Wherefore your orator prays the equitable intervention of your honors, and that said defendant, State of Nebraska, answer the matters set forth and alleged in this bill, and that the boundary between your orator and the State of Iowa may, by the order and decree of this honorable court, be ascertained and established on the line set forth in paragraph 6 of this bill or on whatever line may be found by your honors in the premises to be the true boundary between said States, and that the rights, jurisdiction, and sovereignty of the parties hereto to the territory in controversy may be established and confirmed between them, and that your orator be quieted in the full and free enjoyment of the title, jurisdiction, and sovereignty

over so much of the said land as shall by your honors' decree be found and adjudged to be within the territorial limits of your orator, and that your orator may have such other and further relief in the premises as to this honorable court shall seem meet and consistent with equity and good conscience.

52 May it please your honors to grant unto your orator the usual writ of subpœna, issuing out of this honorable court and under the seal thereof and directed to said defendant, The State of Nebraska, commanding it, *that* a day therein to be inserted, to be and appear before your honors in this honorable court, then and there to answer the premises and stand to, perform, and abide such order and decree as — your honors shall seem meet and equitable.

And your orator will ever pray, etc.

JNO. Y. STONE,
Attorney General for Iowa.

(Endorsed:) Supreme Court U. S. 1890, October term. No. 4. Original. The State of Nebraska, complainant, *vs.* The State of Iowa. Cross-bill of State of Iowa. Filed April 6, 1891.

53 And afterwards, to wit, on the 29th day of April, A. D. 1891, the following entry appears of record, viz:

THE STATE OF NEBRASKA, Complainant,
vs.
THE STATE OF IOWA. } 4. Original.

On motion of Mr. H. J. May, in behalf of counsel for the complainant, leave is hereby granted to file replication herein.

And on the same day, to wit, on the 29th day of April, A. D. 1891, the replication of the State of Nebraska to the answer of the State of Iowa was filed in the words and figures following, viz:

54 In the United States Supreme Court.

The Replication of The State of Nebraska, Plaintiff, to the Answer of the State of Iowa.

This repliant, saving and reserving to itself now and at all times hereafter all and all manner of benefit and advantage of exception which may be had or taken to the manifold insufficiencies of the said answer, for replication thereunto says that it will aver, maintain, and prove its said bill of complaint to be true, certain, and sufficient in the law to be answered unto, and that the said answer of the said defendant is uncertain, untrue, and insufficient to be replied unto by this repliant; without this, that any other matter or thing whatsoever in the said answer contained material or effectual in the law to be replied unto, and not herein or hereby well and sufficiently replied unto, confessed and avoided, traversed or denied, is true; all which matters and things this repliant is and will be ready to aver, maintain, and prove as this honorable court shall

direct, and humbly prays as in and by its said bill it has already prayed.

WILLIAM LEESE,
Sol. for Comp't.
J. M. WOOLWORTH,
Of Counsel.

(Endorsed:) Supreme Court U. S. 1890, October term. No. 4. Original. The State of Nebraska, complainant, *vs.* The State of Iowa. Replication of the State of Nebraska. Filed April 29, 1891.

55 And afterwards, to wit, on the 25th day of May, A. D. 1891, the following entry appears of record, viz:

THE STATE OF NEBRASKA, Complainant,
vs.
THE STATE OF IOWA. } 4. Original.

On motion of Mr. Charles J. Greene, of counsel for the complainant, leave is hereby granted to file the answer of the complainant to the cross-bill of the defendant herein.

And on the same day, to wit, on the 25th day of May, A. D. 1891, the answer of the State of Nebraska to the cross-bill of the State of Iowa was filed in the words and figures following, viz:

56 In the Supreme Court of the United States.

The Answer of The State of Nebraska, Defendant, to the Cross-Bill of The State of Iowa, Plaintiff.

This defendant, now and at all times hereafter saving and reserving to itself all manner of benefit and advantage of exception to the many errors and insufficiencies *to* the said plaintiff's said cross-bill of complaint contained, for answer thereunto, or unto so much and such parts thereof as this defendant is advised is material for it to make answer to, answers and says:

1. This defendant admits the matters and things alleged in the first, second, third, fourth, fifth, and sixth and seventh paragraphs of said cross-bill, save the allegations therein contained as to the boundaries of the States of Iowa and Nebraska and the meander lines of the Missouri river between said States, which descriptions are in some respects inaccurate, but which this defendant believes are substantially correct, and excepting also the allegations in the seventh paragraph of said cross-bill to the effect that the current of said river varies from five to ten miles an hour, and that at the April and June rises the said river leaves its accustomed channel and spreads over a large part of the plain in said paragraph described, which are denied; and this defendant says in that behalf that the current of said river varies from one to seven miles
57 an hour, and that not infrequently it leaves its accustomed channel and has two or three times in the course of the last

quarter of a century spread over a large part of the plain in said cross-bill referred to.

II. This defendant, further answering, denies the allegations contained in the eighth paragraph of the said cross-bill, and says that during the periods of low water in the said river its bed is certain and clearly defined, within comparatively narrow banks, within which its waters are confined, although in the two or three years during the last one-third of a century its waters have overspread large tracts of land.

III. This defendant, further answering, says that between the east line of section twenty-two (22), in township 75 north of range 44 west of the fifth principal meridian, in the State of Iowa, and the west line of section twenty-one (21), in said township and range, the changes in the current and banks of said river have not been at any time so rapid as at many other places in said river, except when, in 1877, the said river cut through its banks in the southwest corner of said section twenty-one (21), as described in this defendant's original bill in this cause.

IV. This defendant denies the allegations of the said cross-bill contained in the ninth paragraph thereof, and in answer to the tenth paragraph thereof says that between the time of the running of the meander line of the said Missouri river on the east bank thereof and 1887 the said river year after year cut into its
58 south bank until in the last-named year its south bank ran through the south parts of section twenty-two (22) and twenty-one (21), in said township 75 north, of range 44 east, and along its north bank new land was formed, not by throwing the earth cut out from the south bank to the opposite side, but by deposits of earth and other matter brought down from the said river from a point above any of those hereinafter mentioned. Whether the course of said river in 1851 or 1877 or at the present time or the meander lines aforesaid or either of them are correctly shown upon the maps attached to the said cross-bill this defendant is not now able to state, and therefore denies the allegations contained in the said cross-bill in that behalf.

V. This defendant denies each and every allegation of the said cross-bill contained in the eleventh, twelfth, thirteenth, and fourteenth paragraphs of said cross-bill, and says that the changes in the course, current, and banks of said river between the termini, in the said cross-bill referred to, were slow and imperceptible, by reason whereof the boundary between said States followed the middle of the main channel of said river.

VI. And this defendant, further answering, admits that the State of Iowa has at times, but not always, claimed jurisdiction and governmental authority over a large part of the territory lying south and east of the meander line of the south bank of said river
59 run in 1851, and has levied taxes thereon and asserted authority over the said land, but denies that it has exercised such jurisdiction or levied said taxes or attempted to maintain order over the said lands until four years last past; and this defendant admits that it has claimed jurisdiction or sovereignty over said ter-

ritory and citizens thereof, but denies that it has done so unjustly or illegally.

VII. And this defendant denies all combination, conspiracy, and confederacy in the said cross-bill charged, without that, any other matter or thing material or necessary for it to make answer unto and not hereafter or hereby well or sufficiently answered unto, confessed or avoided, traversed or denied, is true to the knowledge or belief of this defendant; all which matters and things this defendant is ready to aver, maintain, and prove as this honorable court shall direct, and humbly prays to be hence dismissed with its reasonable costs and charges in that behalf most wrongfully sustained.

THE STATE OF NEBRASKA,
By GEORGE H. HASTINGS,
Att'y Gen'l.

J. M. WOOLWORTH,
CHAS. J. GREENE,
Of Counsel.

(Endorsed:) U. S. Supreme Court. Oct. term, 1890. No. 4. Original. State of Iowa *v.* State of Nebraska. Answer of State of Nebraska to cross-bill. Filed May 25, 1891.

60 And on the same day, to wit, on the 25th day of May, A. D. 1891, the following entry appears of record, viz:

THE STATE OF NEBRASKA, Complainant,
vs.
THE STATE OF IOWA. } 4. Original.

On motion of Mr. Felix A. Reeve, in behalf of counsel for the defendant, leave is hereby granted to file replication to answer of complainant to cross-bill of defendant herein.

And on the same day, to wit, on the 25th day of May, A. D. 1891, the replication of the State of Iowa to the answer to the cross-bill was filed in the words and figures following, viz:

61 Supreme Court of the United States.

STATE OF IOWA
vs.
STATE OF NEBRASKA.

Replication of The State of Iowa, Plaintiff, to The Answer of The State of Nebraska, Defendant, to the Cross-Bill Herein.

This repliant, saving and reserving unto itself now and at all times hereafter all and all manner of benefit and advantage of exception which may be or had to be taken to the manifold insufficiencies of the said answer, for replication thereunto says that it will aver, maintain, and prove its said bill of complaint to be true, certain, and sufficient in law to be answered unto, and that the said answer of the said defendant is uncertain, untrue, and insufficient

to be replied unto by this repliant; without this, that any other matter or thing whatsoever in the said answer contained material or effectual in the law to be replied unto and not herein and hereby well and sufficiently replied unto, confessed or avoided, traversed or denied, is true; all which matters and things this repliant is and will be ready to aver, maintain, and prove as this honorable court shall direct, and humbly prays as in and by its said bill it has already prayed.

JNO. Y. STONE,
Att'y Gen'l of Iowa.

(Endorsed:) Sup. Court U. S., October term, 1890. No. 4. Orig'l. Rec'd May 12, '91. State of Iowa *vs.* State of Nebraska. Replication of State of Iowa. Jno. Y. Stone, attorney for plaintiff. Filed May 25, 1891.

62 And on the same day, to wit, on the 25th day of May, A. D. 1891, the following entry appears of record, viz:

THE STATE OF NEBRASKA, Complainant,
vs.
THE STATE OF IOWA. } 4. Original.

On motion of Mr. Charles J. Greene, of counsel for the complainant, it is ordered by the court that the testimony to be taken in this cause be taken in accordance with the stipulation of counsel this day filed by leave of the court.

And on the same day, to wit, on the 25th day of May, A. D. 1891, the stipulations as to taking testimony were filed in the words and figures following, to wit:

63 Supreme Court of the United States.

STATE OF NEBRASKA
vs.
STATE OF IOWA. } Stipulation for Taking of Testimony.

It is hereby stipulated by and between the plaintiff and defendant herein that the evidence adduced by both parties shall be taken before T. C. Dawson, of Council Bluffs, and H. B. Smith, of Omaha, sitting together as commissioners; that said evidence shall be by them jointly certified, and that all said testimony shall be taken and returned into this court by Oct. 1st, 1891.

JNO. Y. STONE,
Att'y Gen'l of Iowa, for Def't.
J. M. WOOLWORTH,
For State of Nebraska.

64 Greene & Baxter, Omaha.

Supreme Court of the United States.

STATE OF NEBRASKA
vs.
STATE OF IOWA. } Stipulation for Taking of Testimony.

It is hereby stipulated by and between the plaintiff and defendant herein that the evidence adduced by both parties shall be taken before T. C. Dawson, of Council Bluffs, and H. B. Smith, of Omaha, sitting together as commissioners; that said evidence shall be by them jointly certified, and that all said testimony shall be taken and returned into this court by Oct. 1st, 1891.

JNO. Y. STONE,
Att'y Gen'l of Iowa.
GEO. H. HASTINGS,
Att'y Gen'l of Nebraska,
By J. M. WOOLWORTH.
C. J. GREENE, *Of Counsel.*

(Endorsed:) Supreme Court U. S., Oct'r term, 1890. No. 4. Orig'l. The State of Nebraska, complainant, *vs.* The State of Iowa. Stipulation as to taking testimony. Office Supreme Court U. S. Filed May 25, 1891. James H. McKenney, clerk.

65 And afterwards, to wit, on the 21st day of December, A. D. 1891, the following entry appears of record, viz:

THE STATE OF NEBRASKA, Complainant,
vs.
THE STATE OF IOWA. } 4. Original.

On motion of Mr. C. J. Greene, of counsel for the complainant, leave is hereby granted to file the testimony taken in this cause and exhibits, and the cause is assigned for argument on the 25th day of January next after the case heretofore assigned for that day.

66 And on the same day, to wit, on the 21st day of December, A. D. 1891, the testimony taken in this cause was filed in the words and figures following, viz:

67 In the Supreme Court of the United States.

STATE OF NEBRASKA
vs.
STATE OF IOWA. } Bill in Equity.

STATE OF IOWA
vs.
STATE OF NEBRASKA. } Cross-Bill.

Testimony taken on behalf of both parties in said causes by and before Howard B. Smith and Thomas C. Dawson, examiners and commissioners appointed by this court to take evidence in said causes in pursuance of the stipulation made by the parties thereto and on file herein.

The commissioners met on August 10, 1891, and on divers days subsequent thereto and prior to September 30, 1891, due notice having been given to the counsel for both parties, J. M. Woolworth, C. J. Greene, and John R. Webster being of counsel for the State of Nebraska and Jno. Y. Stone, attorney general, Smith McPherson, and J. J. Stewart for the State of Iowa, and the following witnesses were produced, sworn, and examined on the part of the complainant and respondent respectively, as hereinafter appears, and gave the following evidence:

68 CHARLES B. RUSTIN, of lawful age, being first duly sworn upon the part of the plaintiff, testified as follows:

Examined in chief by Mr. C. J. GREENE:

Q. State your name, age, and place of residence.
A. Charles B. Rustin; age, 55; residence, Omaha, Nebraska.
Q. How long have you resided in Omaha?
A. Continuously since 1863 or the spring of 1864.
Q. In what business were you engaged from 1864 until 1872?
A. I was in the ferry and transfer business.
Q. On what river and at what locality?
A. Missouri river, between Omaha and Council Bluffs.
Q. Are you acquainted with the Missouri river between Omaha and Council Bluffs and vicinity?
A. Pretty well acquainted; yes.
Q. How long have you known it?
A. Since 1864.
Q. Are you acquainted with its character and habits and history since that time?
A. Acquainted with its habits?
Q. Yes, sir; and with its history.
A. Somewhat; yes, sir.

69 Q. Well, Captain, where did it run; about where was its channel when you first knew it, in 1864, say, in the vicinity of sections 20, 21, and 22, in township 75, range 44, in the State of Iowa?
A. As compared to the meander line of 1856, in section 20, that

meander line would have been a little further west than shown by the map, the meander line of 1856.

Q. You mean the channel would be a little further west?

A. Yes; the meander line also. The meander line at that time was the west shore of the river.

Q. The meander line was established in 1856?

A. Yes, sir; both the channel and the shore were further west.

Q. Of course the meander line does not move, but the river or bank of it?

A. The bank had cut away at that time at this point. (Witness here pointed to section 10, Nebraska, on Exhibit "B.") As a consequent reaction down section 28 the channel was further east; it cut in further east in 28 and 29.

Q. How was it in section 22?

A. In section 22 all the encroachments were on the Iowa shore all the time from 1864 to 1877.

Q. Where was the bank?

70 A. There was a gradual cut and change in there (pointing to section 22 in Iowa, Exhibit "B"). As to the exact point I could not say, but I should say somewhere in 22.

Q. That is to say, in 1864, when you first knew the river, it ran somewhere in section 22?

A. Yes, sir.

Q. Now, about where would you locate it?

A. I should put it in the north line of section 22.

Q. That is not the north line of 22; that is the center of the north half?

A. A little south of the center of the north half, I should put it.

Q. Now, then, from that time on what was the history of the river?

A. The river kept sutting south down through 22 here (witness pointed to section 22, Iowa, on Exhibit "B"), cut in south, and also rounding out something in this shape (witness here described curves in section- 22 and 21, Iowa, Exhibit "B"), on side encroaching on the Iowa shore, making innovations this way and making innovations south and west.

Q. Where was its channel in 1877?

A. In 1877 it ran as shown here on this map (witness here pointed to Exhibit "C"), broke through, and my recollection is——

71 Q. Then when you say this map you mean Exhibit "C," do you?

A. Yes; I suppose so.

Q. Well, then, I will ask you to locate upon the tracing which we call Exhibit "C" and state whether it shows where the river ran about 1877.

A. Yes; 1877.

Q. What change occurred in the history of the river afterwards?

A. In the old bed?

Q. Yes; any sudden change.

A. No, sir; the old bed has been gradually filled up.

Q. I mean what occurred after the channel had become estab-

lished around here, as shown by Exhibit "C," what change occurred in the river.

A. It broke through this narrow neck (witness pointed to lot 1, section 29, Exhibit "C"), the current striking the west shore from the east and coming around on the Nebraska side after making the bend; this, being lower than the Iowa side, broke through.

Q. Where did the channel go, or the main current of the river?

A. It took the short cut and came over to the Nebraska side.

Q. What became of the old channel of 1877?

A. A large portion of it has filled up—that is, north of this
72 neck of land where she broke through.

Q. What was the character of these changes which you have described as occurring between 1864 and 1877?

A. Gradually encroaching on the outer periphery of the bend and gradually filling up on the inner side of the bend.

Q. Were any of these changes sudden or considerable that occurred during these years?

A. No, sir; there was a good strong wash in places; gradual change.

Q. What is the character or habit of the river with regard to changing its channel in flood waters or high tide?

Question withdrawn.

Q. How are sudden changes in the channel of the Missouri river brought about?

A. They are brought about by the under-currents and by the washing; wherever there is a bend in the river, the current striking that bend, it has to make a corresponding reaction at an opposite bend; the currents keep changing and following the bends. In those bends occur large washouts; bring two bends together and you are going to have a cut-off. They are brought about by under-currents and undermining instead, as a great many suppose, from overflows on the surface.

Q. Does the fact of overflow on the surface bring about a
73 change after the waters have subsided in the channel; does that occur or not?

A. No, sir.

Q. What opportunities did you have for any intimate knowledge of the river from 1864 to 1872?

A. During those years I was engaged in ferrying; at times we had to ferry this distance from here, some eight or ten miles, to 27 or 22, to make landings.

Q. From where?

A. From Omaha.

Q. From what street?

A. All the way from the old telegraph pole, which would be about Nicholas or Izard, down to Jones street; we had landings at various places.

Q. At Omaha your landings were at various places from between Nicholas and Jones streets.

A. Mostly near Nicholas or Izard.

Q. Where was the landing in Iowa?

A. Most of the times at the foot of Broadway, a little north of that, but at times we had to make this point.

Q. At these times you speak of where did you land; in what section?

A. We landed out here in 22 somewhere; along in this vicinity.

Q. Landed somewhere along about the center line of 22 or south of that?

74 A. Center line going east and west; about that.

Q. East and west center line of section 22?

A. I am speaking of the years 1866 and 1867.

Q. Then were you at times in command of the boat?

A. I was captain; yes, sir.

Q. And who was your pilot at that time?

A. We had two pilots—Mr. Dan. Shull and Mr. John McPherson.

Q. Now, in navigating the Missouri river from your landing in Omaha to about here, to the landing in the south half of section 22, in Iowa, what course did you describe?

A. Well, we went pretty near all points of the compass.

Q. Well, starting, going up the river from the landing here in Omaha, which was your general direction?

A. We went north about three miles.

Q. Then what direction did you go?

A. East.

Q. Then what?

A. Then south and southeast.

Q. And then turned in about this way (indicating east) at that time, then east?

A. We also cut wood. You was asking my means of knowledge on section 20 and 28. The ferry company owned land over there, and also north of section 23.

75 Q. Has the ferry company continued to own land along the river until now?

A. In section 20, 28, and 29, yes, but not in 23.

Q. Have you during these years paid any attention to the river and its changes with reference to your lands?

A. Yes, sir.

Cross-examination.

By Mr. STONE:

Q. What is the distance from the landing on the Omaha side to the landing on the Council Bluffs side, in section 22?

A. That is a rather difficult question to answer.

Q. Approximate it.

A. I should say about eight miles. You understand our landings on the Missouri river were cutting and changing. We were continuously making new landings on this side and on the other side. For instance, we had landings we could go to for awhile, and then we would have to go up around the bend.

Q. You mean by the other side the Iowa side?
A. Yes, sir.
Q. How much of the time between 1864 and 1877 were you required to go around to the bank?
76 A. Very little. I think there was one high water of 1867. Perhaps we ran for three or four weeks. That is, I think, the longest time we ever ran.
Q. Where were these landings during the greater part of the time you were operating your boat on either side?
A. We landed more at what was called the telegraph pole. I should locate that about Grace street. I cannot tell from these maps.
Q. What direction was that from the center of section 28 on the Iowa side?
A. North of opposite.
Q. Almost due west?
A. North of that.

By Mr. GREENE:

Q. That was along about Izard street?
A. Yes; we landed here.

By Mr. STONE:

Q. About how many different landings did you have during this period between 1864 and 1877?
A. We had a great many.
Q. By reason of the changes in the river?
A. Yes, sir.

By Mr. GREENE:

Q. You speak about changing your landings; give us an illustration of the character of the changes you mean. Take, for instance, the Florence cut-off business; explain that fully.
77 A. The causes are numerous for the changes; a snag or sand bar will change the channel. If the cut-off had been 60 miles above here it would affect the channel at this point. I remember distinctly the cut-off at Rockport. A cut-off was made there similar to the cut-off here in 1877; it changed the channel, changed the current against the shore here, and took it up on the opposite side of the river. Almost immediately after that changes were occurring continually in the Missouri river. A pilot, by his knowledge and judgment of the water, and judging the river from the surface, didn't run necessarily in one channel twice, because the bars are constantly forming, channels continually changing.
Q. Now, the cut-off which you spoke of at Rockport changed the channel somewhat within the banks of the river, as I understand you, up above, which created corresponding changes below?
A. Yes, sir.
Q. So that when it came up to where your landings were at Omaha the channel had changed?
A. Yes—that is, for a short time; those things are constantly

changing. For instance, under this telegraph pole there was a time when the water ran into this point here (pointed to the telegraph point, Nebraska Exhibit "C") and reached
78 over here (witness pointed to section 28, Iowa Ex. "C"), and afterwards, instead of striking out from this point over here (telegraph point), she dropped right under the bend (witness pointed to bend south of telegraph point, Ex. "C") and came right out here (witness pointed to river near Nebraska shore, opposite section 14, Nebraska Ex. "C"); there was an island made, and we had to go away below this island to get a landing on the Iowa side; the bar was thrown above the head of the island, so it was impossible to make a landing directly opposite.

Q. What was the width of the Missouri river in the location you have spoken of?

A. Various widths; sometimes the channel is very narrow.

Q. The distance from shore to shore is 2,500 to 3,000 feet?

A. Yes, sir.

Q. The changes you describe are in the main channel or main *A.* current of the river?

A. I call the main current where the main body of the water is the channel.

Q. The changes where the channel is or currents occurs between these shores?

A. Yes, sir.

Q. Now, would there be corresponding sudden changes in
79 the shore or bank or would these changes be slow and gradual?

A. They would have to be brought about by the washing of the water down here and undermining.

Q. Wherever the river strikes the shore it cuts it?

A. Yes, sir.

Q. And a change in the current of the river may throw it against the shore at some other point?

A. Yes, sir.

Q. And as far as the cutting away of *of* the bank is concerned you claim that to be done by gradual and slow steps?

A. Cuts away faster in some places; depends upon the nature of the soil. This old telegraph point we clung to so long was hard to cut, because it was blue clay. Most points in the Missouri bottom are sand, and the current striking them would cut them pretty lively.

Q. What is the character of the Missouri river in regard to sand bars, things of that sort being formed and washing away constantly?

A. The river is continually changing, forming sand bars, and sand bars are continually changing. The current is in one place to-day and to-morrow in another; sand bars come and go.

80 Q. What is the character of the changes wrought by the action of waters upon the shores of the river?

A. In the outer bend?

Q. I mean in regard to whether they are sudden or whether they are wrought by gradual processes?

A. In the outer bends they are continually being washed away, the shores are being continually washed out, and in the inner part there is a deposit of silt continually being made and accretions formed.

Q. How were these lands, shown upon Exhibit "C," on the Nebraska side formed, and south of the original meander line of Iowa?

A. In times of high water you would see in the inner bend, as the river receded here, a low bar, and the bar would be continually forming of sand and sand be continually deposited. It would be cut out on the outside and continually forming here on the inside.

Q. Was all this land, as shown on Exhibit "C," in section 21 and 22 south of the meander line of Iowa formed in that way?

A. Yes, sir.

Q. And how was this land up here formed (counsel pointed to section 2, Nebraska Ex. "C")—formed the same way—this

81 land up here within the "Horseshoe"?

A. In section 1 and 27?

Q. In section 20, in Iowa, and section 2, in Nebraska?

A. Formed the same way.

Q. North and west of the Nebraska meander line?

A. Formed the same way.

Q. Accretions to what shore?

A. Accretions to the Iowa shore.

C. B. RUSTIN.

JOHN A. SMILEY, of lawful age, being first duly sworn, testified, on the part of plaintiff, as follows:

Examined in chief by Mr. GREENE:

Q. State your name, age, and residence.

A. John A. Smiley; age, 55; residence, Omaha, Nebraska.

Q. How long have you lived in Omaha, Nebraska?

A. I have lived here almost continuously since the 6th day of April, 1857.

Q. What is your profession?

A. My profession formerly was civil engineer and surveyor.

Q. How long have you been acquainted with the Missouri river in the vicinity of Council Bluffs and Omaha?

A. Well, I have been very familiar with the Missouri river since that time—1857.

82 Q. Have you at any time owned lands in the vicinity or near the river?

A. Yes, sir; I pre-empted the west half of the southeast quarter of section 3 and the west half of the northeast quarter of sec. 10, 15, 13, State of Nebraska, Douglas county—that land. (Witness here pointed to S. E. ¼ section 3 and W. ½ of N. E. ¼ of sec. 10, Nebraska Exhibit "B.")

Q. When did you pre-empt that?

A. I settled on that in 1857, when I first came here, and lived on it ever since, and am living on there now. I own a portion of it yet.

Q. State where your residence is situated.

A. My residence is situated just 1,320 feet from the south center line of section 3; on the east side of 16th street, it is now.

Q. On what did you call it, on the bluff?

A. On the bluff; yes, sir; just overlooking the river.

Q. State whether or not a part of your land lies down under the bluff and on the bottoms.

A. Principally on the bottoms.

Q. On the Missouri river bottoms?

A. Yes; it ran within a few feet of the river before the cut-off; the river had cut within my south line within 100 feet of my line—that is, at the center of my east line it was within 100 feet of
83 me and at the north line it ran within probably eight or nine hundred feet.

Q. State from where your house is situated whether or not you could command a view of the Missouri river bottoms and the river during all these years.

A. Yes; we can see over the whole entire bottom from Council Bluffs to Florence; nothing to obstruct our view there.

Q. Your house is located on 16th street, in Omaha, near the fair grounds?

A. Yes, sir.

Q. Where did the river run in 1857 with reference to what is known as the Nebraska meander line?

A. Well, when I came here in 1857 it had made but very slight changes; probably been some little change made when I first came here in 1857 from the Nebraska meander line.

Q. Was the meander line completed at the time you got here?

A. I think not. I think possibly it was completed around this bend, but not clear to Rockport. I think they were working upon Rockport when I got here.

Q. The meander line is marked on the map as the meander line of '56; state whether the work of locating that was carried into the winter of 1857.

A. That is my understanding; I mean they were working at that time on the work.

84 Q. And you came here in April following?

A. April, 1857; yes, sir.

Q. Of course you do not know where the river ran in 1851, at the time Iowa was surveyed—that is, from any personal knowledge?

A. No, sir.

Q. Look at this map, which is marked Exhibit "B," and state whether the river marked thereon was located as it was when you first saw it.

A. Yes; I should say that that was practically correct where I first saw it; now this is all washed out. (Witness pointed to parts of section- 1, 2, 3, and 10, Nebraska Ex. "B.")

Q. Now I want you to look at Exhibit "C" and state whether that shows where the river ran in 1877 and just before the cut-off.

A. Yes; I think that is exact.

Q. It looks to be?

A. Yes; I have to judge, of course, from these points about 700 feet from the river there (witness pointed to a point on the north and south line dividing the S. E. ¼ of section 3, in Nebraska, and a little south of the east and west middle line of said section 3 on Exhibit "C"), and down here (witness pointed to the intersection
85 of the east and west quarter-section line of section- 3 and 10 with the north and south line dividing the S. E. quarter of section 3) about 100 feet should be 1,300 feet to the center of that line right there (witness here pointed to the intersection of the north and south middle-section line of sections 3 and 10 with the east and west line which divides section 10) at that given point. I know the exact distance there; it is 200 feet. (Witness here pointed to a point on the north and south line dividing the S. E. ¼ of section 3 and a little north of the east and west line which divides section 3 from section 10.) I watched that very critically, because my land joined right on there to the Brentnel pre-emption that cut 100 feet and this 200 and this 750, and I was anxious on account of my own ground. The land I had was valuable property, as it was the key to the railroad situation in Omaha.

By Mr. GREENE: The points designated are points on the east and west center line of section 10, and also section 3, and also upon the east and west quarter line between sec. 3 and 10 in Douglas county, Nebraska.

Q. Now, state how the change of the river was brought about.

I will ask you first where was the river cutting, if any, when
86 you came here opposite sections 21 and 22, in township 75, — 44, State of Iowa?

A. Well, it was cutting rapidly. The most rapid cutting was north. It was cutting east and west both at the same time.

Q. How was it with reference to cutting into sections 22, township 75, — 44, in that locality; which shore was it cutting into?

A. Into 22, on the Iowa side, and continued to cut in there.

Q. Where was it cutting in the vicinity of sections 1, 2, and 3 and 10, in Nebraska?

A. It was cutting north gradually in sec. 1, a little more rapidly in 2, and very gradually into 10 and 3, Nebraska.

Q. And how was that where it was cutting upon one side; what was transpiring on the other side—the opposite?

A. It is the rule of the Missouri river that it fills propostionately on the opposite side as it cuts. For instance, it cuts on the Iowa side and it is filling on the Nebraska, and, cutting on the Nebraska, it is filling on the Iowa.

Q. Was that the fact in relation to what was transpiring?

A. Yes; that was the fact in relation to this whole entire bend and has been for 30-odd years; but the river practically keeps its natural width; it has not changed its width at any one point I

know of, only flowing over a little ground, but practically
87 keeps its own width and cuts on one side and fills on the opposite.

Q. About when did the sudden change in the river take place?

A. The cut-out—we call it the cut-off—my recollection is I was away when that happened. It was cut down to a very narrow neck, and we all expected it to go through at any time. My recollection is it was in 1881. It might have been prior to that; I believe it was in 1877.

Q. Have you at any time during these years done any surveying in the locality mentioned?

A. Yes; I surveyed some timber land in *in* that bend away back in the 50's up to the northeast; subdivided some timber land.

Q. About where was that?

A. That must have been in the next township north.

Q. In Nebraska?

A. Possibly some of that was in section 36—school section now. I know it is just exactly north of section 1, in the bend there, and I remember subdividing for a gentleman by the name of Creighton there—he died years ago—James Creighton. I subdivided a lot of timber land there in 1857 or '58, in the school land there.

Q. Well, now, Mr. Smiley, state whether or not the change
88 from where it ran in 1856 to where it ran in 1877 was a slow and a gradual one or whether it was sudden and considerable.

A. There was no sudden change in the term of 21 years; it was gradual, slow, every year cutting some and filling some on the opposite side.

Q. How was this land that appears to be in sec. 22 and 21, in Iowa, formed south of the Iowa meander line of 1851?

A. It was gradually cut out and gradually filled back in.

Q. It was gradually filled how?

A. By accretions from the river.

Q. And how was the land north of the meander of 1856, in what appears on the map as sections 2, and within the "horseshoe" formed?

A. Cut out by the cut of the river north, in section 2, and gradually filled back.

Q. Formed by accretion?

A. Formed by accretion and cut out by the river and then filled in opposite, same as the river filled in all cuttings and fillings.

Q. How wide is the Missouri river? What has been the average width of the Missouri river in natural stages of water during the last thirty years?

A. That is, by actual measurement? I should judge somewhere in the neighborhood of 2,500 to 3,000 feet in ordinary
89 stages of the water; some places less and some places it would be more.

Q. Is this entire river bed covered at all seasons with water?

A. No, sir.

Q. What about sand bars; are there any?

A. There are sand bars continuously the *the* whole length of the Missouri river until you strike Yankton; the first rock bar is at Yankton.

Q. What effect has the waters upon these sand bars with regard to changing their form and character, washing away and forming?

A. There is a peculiarity about all quicksand streams; as the water runs higher the bars flatten out. It is much easier to ford quicksand streams when the water is high than low.

Q. Are sand bars constantly changing?

A. Yes, sir.

Q. Do the changes of the Missouri river themselves effect the shore one way or the other?

A. Yes; affect them continually. A very small matter, a snag in the river, will throw the current so it will commence cutting in the river and cut for 100 feet.

Q. So that changes there in the shore are brought about by cutting on one side and filling in on the other?

90 A. Yes, sir.

Q. But changes in the bar may be brought about by the changes of the waters?

A. Yes, sir.

Q. How are cut-offs formed?

A. Cut-offs are formed by a pres-ure of the water. The river has a certain fall. Take the cut-off here at Omaha, right in view of us here; had a fall of three miles. When it cut enough for the water to get through the quicksand it went through; did not cut on top. That is a mistake. It cut through the quicksand underneath; got the pressure of the water right through, and your cut-off is made almost instantly.

Q. Then a cut-off is only brought about when a neck of land between the two parts of the river becomes so narrow that the water permeates the quicksand underneath.

A. Yes; the pressure is such that it presses right through and opens the quicksand.

Q. Are you acquainted with the Missouri river from its source to where it empties into the Mississippi?

A. I have never been higher than Fort Sully.

Q. Where is that?

91 A. It is in Dakota Territory somewhere; in the neighborhood north of Pierre.

Q. How far down the river below Omaha have you been?

A. The entire length of the river south several times—a great many times—and a great many times as far north as Fort Sully.

Q. Are your statements in regard to the manner in which cut-offs are formed applicable to all cut-off- of the river?

A. I think so. I was personally cognizant of the cut-off at Rulo, which is a very prominent one. I happened to be camped on the river the night the cut-off was made. It went through in three hours. I studied it very carefully there and saw one at Rockport. I was not at Omaha the time this cut-off was made.

Q. When did you leave Omaha at the time of the cut-off?

A. I left in 1876—January, 1876.

Q. At that time did you know how wide the neck was between the two parts of the river as it ran through the cut-off?

A. I do not, but I do not think it was over ½ mile wide.

Q. What was the nature and character of the cut that was being made about that time?

92 A. The river was cutting southwest and northeast right against itself there at that time.

Q. State what change in the course of the river occurred at the upper point of the horseshoe before the cut-off occurred.

A. It ran in a northeasterly direction, very nearly.

Q. Before it made the turn which direction was it running?

A. Before it made the turn it was running very nearly southwest.

Q. And at the bend it made a turn and ran back northeast?

A. In a northeasterly direction.

Q. How far was it, then, from this point to the point opposite, around the river?

A. That would be by actual survey there, I should judge, three miles. We used to call it that.

Q. Might be more?

A. Might be more.

Q. So that at that time the river was travelling three or four miles to get a half a mile?

A. Yes; that was the fact.

Q. Did the river at any time during its changes from the channel of 1856 to the channel of 1877 make any sudden or considerable changes in either shore?

A. No, sir: they were gradual.

Q. Were all the changes brought about in either shore
93 occasioned by cutting and filling and by slow and imperceptible processes?

A. That was a fact; slow and imperceptible and gradual cutting every year.

Cross-examination.

By Mr. STONE:

Q. How far was your house during this period of 19 years from the channel on the east side of the bend in front of your house?

A. On the east side of the channel?

Q. On the east side of the bend.

A. Do you mean of the old meander of the bend?

Q. This channel on the east side of this bend as it was before the cut-off.

A. It is a mile and a half across there to the east side of the river, where the channel ran.

Q. It was then about two miles from your house to where you say this land was made, on the east side of that channel?

A. It would be, take it straight through east on the center of sec-

tion 3, there by my house; it would be just about two miles to the east line.

Q. There was some 700 to 900 acres of land made during that period of time on the east side of this bend, was there not?

A. Yes; I should think more than that.

94 Q. How much would you think there was?

A. More than that formed in there. My recollection of the old lake in there, and I cut out a good deal of timber around in there. There must have been over 2,000 acres formed in there in 18 years. We call that the cut-off made in '57 that would take a circle around that bend.

Q. You mean that was made against the Nebraska shore?

A. Yes, sir; must have been that there from my actual knowledge of the survey.

Q. It was about two miles from your house across to that?

A. Yes; to where this commenced, and it has extended further over.

Q. That is, to where it commenced on the north part of it?

A. Away back in 1857, on the meander, the river came through, and there was a large lake against Council Bluffs, and the river came circling through and ran down here.

Q. It is further from your house to that point of land now?

A. I think that point of land now is four miles. We ran that township line a few weeks ago. It is either four miles and 1,320 feet or four and a half.

Q. You say this 2,000 or more was made imperceptibly?

95 A. Yes, sir.

Q. How are you able to say that?

A. See it from year to year.

Q. Did you ever sit on the shore and watch it form?

A. No, sir.

Q. You were two miles from it, were you not?

A. Yes. Sometimes I was on the bank.

Q. How often?

A. Very often; at work.

Q. What was you doing?

A. Hauled a good deal of wood; supplied the Government with wood.

Q. You were on that land very often?

A. Yes, sir.

Q. Made land?

A. Yes, sir.

Q. Was the wood on it very large?

A. No, sir; it kept growing. These fellows kept surveying.

Q. Did not they ever get satisfied with their lines?

A. No, sir.

Q. How often did they survey?

A. Every year or two I would hear of it.

Q. What for?

A. Surveying their farms.

Q. Every few years?

A. Yes, sir.

Q. How many surveys in 19 years?

96 A. I do not know. I think several.

Q. Did you ever see them surveying there?

A. Yes, sir.

Q. How often?

A. I never was in there but once on a surveying expedition.

Q. Did you ever look to see whether that land was made gradually as it was being formed?

A. Why, I know that like the preacher knew it—by induction. I know it by seeing it done.

Q. Did you see it?

A. Saw the banks cutting away on one side and gradually filling up on the other for thirty-four years.

Q. How long was that process going on there?

A. Before this cut-off every day until the Government had stopped it.

Q. Do you mean to say you could see it?

A. Yes; you could see the bank falling in on one side every time you would go on the bank of the river—you could see a change. If you would survey a piece of land this year and go back and survey it next year you would find there was an accretion or cutting off on the other side.

Q. How much?

A. Sometimes it wouldn't go ten feet.

97 Q. In 19 years it went about a mile and a half from north to south?

A. Yes; I guess all of that.

Q. And that was so imperceptible and so gradual that it would not be discovered except from year to year?

A. Yes; it could be discovered if you were making surveys there, but if a man was riding horseback or driving a team he would find you had lost several feet of ground on that side..

Q. Were there any floods during this time—during which all the land over there was submerged?

A. Yes, sir.

Q. How many?

A. Well, in 1881—I was not there previous to 1881—I think there was two high waters that covered all the low bottom, what we call the low bottom. I think there was two, but what years I could not tell you.

Q. How many times were you on that 2,000 acres of land while it was being formed?

A. That would be — very hard question for me to answer.

Q. What were you doing over there when you were there?

A. Buying wood for the Government sometimes.

Q. Whom were you buying of?

98 A. I bought 150 cords of wood—car-box timber that was cut over there for several years; that country all washed out to the northwestern road—that is, all on this side of the river to-day.

Q. How many acres?

A. Several hundred acres; I bought nearly all that wood for the Government.

Q. Didn't that land go over after the timber was cut off?

A. It could not get over very well with the timber on it.

Q. How many years were you engaged in that hauling and cutting wood?

A. I wasn't cutting any; hauled it; I do not know how many years.

Q. How many cords of wood did you handle altogether?

A. I do not recollect.

Q. Couple of thousand?

A. Yes; a good many thousand.

Q. Whose timber was it?

A. I did not get it all there.

Q. How much of the time were you on the 2,000 acres of made land?

A. We were not on that made land at that time; we were on solid ground before it washed away.

Q. How much of the time were you on the made land?

A. I went over it occasionally with my team; went over to measure wood and direct its hauling.

99 Q. Was the wood on the new-made land?

A. No, sir.

Q. How did you go over there to measure your wood; you do not mean on the new land?

A. No, sir; I went over where the wood grows.

Q. How did you come to be on the new land so as to see what was going on there; you would have to be across the river to do that?

A. No, sir.

Q. What was you doing there then; you was not after wood?

A. No, sir; I was out there last week.

Q. What were you doing out there during those 19 years?

A. I was out there hunting and fishing and getting grapes; I was hauling wood from different points in there, and buying wood.

Q. Not from different points on the new land?

A. No, sir; I did not say anything about the new land.

Q. How many times were you on that new land along the river as it was being formed?

A. Every year; as I was at home.

Q. Do you swear you were on once every year you were at home?

100 A. Yes; I would swear twice every year I was at home.

Q. What were you doing there?

A. Hunting grapes.

Q. Would there be grapes in there in two years after it was formed?

A. Yes; grapes were in there two years after the sand bar was formed.

Q. And you were the- graping?

A. Yes; and fishing.

Q. You would fish on the side where the land was made. Was not that a very shallow place to fish where that deposit would be made up against the land?

A. There were bayous in there.

Q. Fished on that side in preference to where the break-off was sudden?

—. ——.

Q. How many times did you go fishing on that new-made land?

A. I call that land new-made. I have gone on it at different points every year. I was at home for thirty-five years.

Q. How many times a year during that 19 years?

A. I do not know; probably once a year.

Q. And from the observation you made at those periods, you state now that the formation was gradual?

A. Most undoubtedly.

Q. And imperceptible?

A. Imperceptible without measurement; not imperceptible to an engineer that comes along there and measures the ground.

101 Q. What do you mean by imperceptible?

A. Well, you might ride over it every week and you would not notice it was going, and you might drive a stake and then go back in three months and take a measurement of a certain piece of land and you would find you had lost 100 feet of ground.

Q. Take that was made on the opposite side. What do you mean by imperceptible there?

A. You cannot tell by the rise and fall of the river how much ground you are getting. The river bars are governed entirely by the fall and rise of the water; when the water goes down the bars raise.

Q. In a new place?

A. Yes; sometimes in a new place.

Q. Sometimes the water will come up where there are no bars and when it goes down there are bars there. That is what you mean by imperceptible formation?

A. I mean by imperceptible formation you cannot see from day to day any change, but you can by actual measurements.

Q. Now, suppose there is fifty or 100 acres of change made by sand under the surface of the water while a flood is going on, and when the flood subsides there is your sand bar?

102 A. It is a well-known fact it does not cut as fast when the river is high as when it is low.

Q. That actually happens—that many acres will be seen in a place when the flood has gone down where it was not seen before?

A. That is not true.

Q. How do they form in a flood?

A. They flatten out in a flood.

Q. Do not they raise?

A. They raise as the water goes down.

Q. That is, they change; acres and acres of them built on when the water goes down?

A. That never happens; I do not believe that ever happens; maybe some impediments get in the water; snags get in the water and occasion a change in the channel.

Q. And the extent, then, of your observation of the new-made land along the bank as it was being formed was when you were hunting and fishing and hunting grapes?

A. Yes, and surveying; and different times I was out there on business.

Q. What kind of business?

A. I had stock out there occasionally, and would go after that.

Q. It was on the opposite side of the river from you?

103 A. No, sir.

Q. Had to go up on that 2,000 acres on the other side?

A. No, sir.

Q. It was not on the other side, then?

A. No, sir.

Q. Then you were not over on that land looking after your stock?

A. No, sir; not across the river.

Q. Did you go across the river to fish?

A. Yes, sir.

Q. Where did you cross?

A. On the ferry-boat.

Q. Went across purposely to fish on new-made land—shallow water?

A. No, sir.

Q. Was not that water shallow next to that new-made land?

A. It was not new-made land there; it was deep water all the way round. (Witness pointed to Iowa shore in section- 27 and 28, Ex. "C.")

Q. How was it on this side? (Council pointed to Nebraska shore, opposite section- 27 and 28, Iowa Ex. "C.")

A. Shallow.

Q. Did you hunt any there?

A. O, yes; very frequently on this side.

Q. What was your notion for going over there and hunting when there was good hunting on this side?

104 A. There used to be better fishing over on that side.

Q. You went over on the ferry-boat to fish?

A. Would take the team and drive over there.

Q. When did you commence to consult with anybody about this land?

A. I have not consulted with anybody.

Q. Have you had any conversation with anybody about the word "gradual"?

A. I have not. I think I know what it means.

Q. Has it recently come up in your discussions as to what the word imperceptible meant?

A. No, sir.

Q. I suppose nothing has been stated that these changes were slow?

A. No, sir.

Re-examination by Mr. GREENE:

Q. I will ask you if any attorney of the East Omaha Land Company has ever discussed this question with you any further than to ask you what your recollection was.

A. I have not, sir; no person—attorney or anybody else.

Q. About the sand bars within the banks of the river? There is a certain per cent. sand and a certain per cent. water?

A. Yes, sir.

Q. The sand is constantly shifting and changing?

A. Yes, sir.

105 Q. May sometimes form a bar along the shore and the next one be wiped out?

A. Yes, sir; that is the character of the river.

Q. The shore is something different from the sand bars and it is cut out constantly by the waters pressing against it?

A. Yes, sir.

JOHN A. SMILEY.

Dr. GEORGE SMITH, a witness of lawful age, being first duly sworn on behalf of plaintiff, testified as follows:

Examined in chief by Mr. GREENE:

Q. State your name, age, and residence.

A. George Smith; age, 66; residence, Omaha, Nebraska.

Q. How long have you lived in Omaha?

A. Something over 36 years.

Q. Came here in 1856?

A. April, 1856.

Q. Were you here at the time Nebraska was surveyed?

A. Yes, sir.

Q. And the time the river was meandered?

A. Yes; I was here at the time Wm. M. Byers developed his contract here.

Q. What is your business?

A. Surveyor and engineer.

106 Q. What official position have you held in Douglas county?

A. I have held the county surveyor's office 22 straight years—from 1865 or something till four years ago; have been deputy since.

Q. You are pretty familiar, then, with the surveys in Douglas county, Nebraska?

A. I have made a great many of them or redeveloped original surveys.

Q. Are you acquainted with the Missouri river between Council Bluffs and Omaha?

A. Well, it has been under my observation during the years I have lived here. I have noticed it.

Q. Are you acquainted with the river in the locality of the cut-off, both above and below where it occurred?

A. I am quite familiar with its traversing and location in that vicinity.

Q. Do you know where the river ran in 1856, when you came here?

A. It ran where the meander line is developed along the north and west bank.

Q. Do you know where it ran just before the cut-off occurred?

A. Not positively. I used to visit it often to determine ap-
107 proximately what the river was doing, but made no special measurements to determine just how it was located and where.

Q. Do you approximately know where it ran in 1877?

A. It had approximately about a half mile between the river above and the river below. There was about that space in walking through willows and thickets. It seemed about that distance. I never measured that distance.

Q. How was the change in the river brought about—that is, the change in the river between 1856 and 1877?

A. It was all by abrasion and accretion until the abrupt cut-off of 1877. It had worked to an immense crook. It was a fair straight channel from '51 to '56. It traveled south on the east part of the bottom. It traversed north on the westerly part and brought itself winding towards each channel. Each side of the banks would wind towards each other and encroach upon each other. That made a great loop; probably in the neighborhood of four miles around.

Q. What was the result of the cutting of the river in the Iowa shore upon the opposite of sections 21 and 22, in township 75, 44, State of Iowa?

A. That meander—that old bank—was run in 1851. I do
108 not remember the contractor's name; but in 1856, when W. M. Byers was running the meander lines of Nebraska, the abrasion had been to such an extent that he really crossed the Iowa meander, taking the Nebraska lands out that he considered worth entering—at least those inland from the water—on the sand bar, and the lines developed that he actually crossed the Iowa meander line. In 1856 I ran up and surveyed and subdivided into lots the island—section 14 in Iowa—all that part of section 14 owned by John A. and H. C. Cline, of Vicksburg. I found about eight rods of the bank had washed away from the line of the original survey. It had traversed west and south.

Q. Describe what you call the banks of the river, Mr. Smith.

A. The bank of the river on an abrasion side is usually perpendicular, a bank of green prairie.

Q. How high?

A. It is owing to the status of the water. It may be ten feet; may be fifteen. It is owing — the stage of the water between the banks.

Q. What was going on further down the river and opposite section- 1, 2, 3 and 10, in Nebraska?

A. It was abraiding, cutting it off into the Nebraska shore.

109 Q. What was going on opposite to these points where the abraiding was occurring?

A. Accumulations and accretions.

Q. Was the change of the river from where it ran in 1856 to where it ran in 1877 a slow and gradual one or was it a sudden and considerable one?

A. The accumulations and abrasions differed in different years, but it was one of these things that was constantly wearing off on the current side and filling on the opposite shore; some years possibly more than others.

Q. But the whole character of the change between those years was a slow and gradual one, was it not?

A. You can call it slow. It has been thirty years or more.

Q. I mean slow and gradual as contradistinguished from any sudden change; no cut-offs in that time.

A. No, sir.

Q. Was there any sudden change of the channel of the river outside of its banks?

A. No, sir; not that I have had any knowledge of; that it has cut off any portions that I am aware of except by abrasion.

Q. How was this filling done?

A. Deposit of the silt that floats in the Missouri river, and the sand that gets outside of the rapid course settles and forms an accumulation of silt and is deposited; in the rapid current it is
110 kept in agitation, and when it gets outside it is deposited.

Q. When the river is going rapidly on one shore how is it on the opposite as to being agitated?

A. It is more quiet.

Q. Have you at any time during the last 36 years surveyed this land formed to the Nebraska shore by the change in the river?

A. At sundry times I have measured as far as available timber would be considered, but not entirely to the water until within the last two or three years. I have measured it.

Q. When do you now remember your first survey or measurements in the locality of lot —, in sec. 12, in Nebraska, or of Government lot 10, in sec. 1?

A. I measured all of the land lying east of section 1, in range 14, all of sections 12 and 6, immediately south of it, in Nebraska, in 1862.

Q. Now, at that time were there any accretions formed there?

A. There was a great deal of accretions between 1856 and 1862. I should think of sand bars a quarter of a mile.

Q. What other measurements or surveys did you make in that year in that locality?

A. I simply measured south from there, section 1 to lot 1,
111 in section 12, and lot 2, in section 6, would be worth entering, which was Government land. We ran to where the meander corner should have been located. We ran the Government corners down to the southeast section corner of one, and from this corner we ran south 11 chains and we were in the willows; they were high there where the meander corner should be. There were already accretions south and we couldn't see south. I took the man who was with me and set him on my shoulders, and he could see over the willows, and said, "I guess this is worth entering."

Q. Who was that?

A. The late Byron Reed.

Q. Then Byron Reed, in 1863, became the owner of the lots on the border and the accretions to them?

A. Yes; and Frank Smith. There was some lying west.

Q. Government lot 11 was Frank Smith's?

A. Yes, sir; and Creighton's lot 10.

Q. When *you* did you next measure the land formed against these lots?

A. From that time until two years ago I have never measured from those corners to the water in the Missouri river, but have measured at sundry times when Reed would want to sell some acres of cotton-wood. The farmers would come to measure some
112 acres of land. It had accumulated good timber from the time in 1862 to 1870—got splendid wood—and he used to sell it by the acre, and I would measure some acres off.

Q. These measurements were made from time to time since 1862 until within the last two years?

A. Yes, sir.

Q. What did you find had occurred between any particular years that you had measured until the next time with regard to the land?

A. I made no special note as to the border of the river, but would go up to shoot ducks and shoot wild geese there; came around almost every year; drive around on the sand bar and drive away my horse and watched them shoot ducks and geese, and in the summer time hauled my wood from there; would go out on the sand bar and get my winter's wood.

Q. On these excursions would you take any notes?

A. I wouldn't take notes, but it was a notorious fact, and the time I surveyed in section 14, running up from that island, I boarded at the Bousche house, on the bank of the river, and he was talking of getting out of there, for the dirt was falling in constantly; it fell into the Missouri river.

Q. Where was that?

113 A. It would be now on the north bank of the Missouri river.

Q. How far is that from the land in controversy?

A. That forms part of the land in controversy. The river is down here to-day. (Here witness pointed to the S. E. ¼ sec. 22, 75, 44, Iowa, Exhibit "B.") The accretions are from here down along where this boulder bank is; somewhere here (witness pointed to the N. E. ¼ N. E. ¼ sec. 22, 75, 44, Iowa) is where I boarded; the river had cut away in here; some valuable big cotton-woods had gone.

Q. That was cutting into the Iowa shore?

A. Certainly.

Q. And as it was cutting into the Iowa shore what was going on on the Nebraska side of the river?

A. Forming deposits of silt and sand and following it up.

Q. How long was the river changing from where it ran in 1851

to where it ran in 1877; how long was this change going on from '51 to the time of the cut-off?

A. It was the difference in years from 1851 to 1877—it would be 26 years.

Q. Now, was that change a slow and gradual one?

A. It was made along one year possibly more than another,
114 but it was by abrasion and accretions.

Q. Explain this process of cutting out on one side; describe it.

A. The abrasions from a bank on the Missouri river differ from most other rivers that have clay banks and soil. This is quicksand, which has been chawed over a great many times by the Missouri river. It will often work in the bank upon which the current presses, until, by eddying, it *it* will eat out a little shoulder. It will take that shoulder, wear it out; undermine it. It will carry a shoulder sometimes fifty feet wide; dig it out here and run that shoulder down-stream for months; but usually the longest wearing away does not come by pressure on a continuous smooth bank. It will get a little abrupt angle and it will pick it up and carry it until it gets to the end of the bank, and the current goes to the opposite side of the stream. It will carry such a little shoulder and dig them off ten or fifteen or twenty feet, and sometimes the current will carry them slowly away and quicksand will dissolve a little more and down will go another, and every few hours you will hear a pitch of the bank. That is the most rapid abrasion that it makes.

It will constantly wear, and sometimes pieces fall in, but the
115 most rapid is where it gets a little shoulder.

Q. Those cases are exceptional?

A. Usually, after a flood, after the high water has permeated the soil and been over the bottom, where it runs down in July and August, it is so thoroughly saturated that the pressure of the current, after the river is receding, will carry away the bank in quantities. It will carry it away more rapidly after a flood, when it has been saturated. The current will go most where it has a mind to.

Q. These pieces are dissolved?

A. They are dissolved, and that is what gives the transparent color of the Missouri river.

Q. This process was going on on the abrasion?

A. The abrading or wearing away.

Q. Now, I didn't quite get you on record about your familiarity with the land. Where was the land the last ten years? How far south had the river moved in section- 22 and 21 within the last ten years?

A. The cut-off was made—I would like to have a photograph—the cut-off was made north of the present river. It has abraded just about the width of the water in the river to-day.

Q. You started in at 1863, year after year, as the land was being formed; you were down there and saw it?

116 A. Yes; almost every year I have been on that bottom, but made no special measurement to determine the fact.

Q. Now, I want to know if during the years between 1856 and

1877 there was a constant, continuous gain on the Nebraska shore and a constant losing on the Iowa shore.

A. That has been the fact absolutely, not necessarily uniform, annually an abrasion upon the Iowa shore and an accumulation on the Nebraska shore. There are other ones—an abrasion on the Nebraska shore and an accumulation upon the Iowa shore.

Q. So that accretions were being formed to section- 20 and 21 in Iowa contemporaneously with the accretions forming to 12 and 1 in Nebraska?

A. Yes, sir.

Q. Now, what is there about the change of the river during floods? Describe that.

A. I know of no changes during floods.

Q. What about sand bars in the Missouri river?

A. Sand bars form where there is the least current and least agitation.

Q. Are they subject to sudden changes?

A. They are liable to be swept away where the river falls.

Q. Do they have anything to do directly and immediately with the banks of the river?

117 A. At sometimes when they have become bold enough it will sometimes force the current against the permanent shore or ground and abrade it; wash it away.

Q. It is the water that always wears the shores?

A. The channel of the Missouri river is something over which neither man nor anything else seems to have any control, and it will take out things in the way. We had a pre-emption on a big sand bar here on the Missouri river, but the man had to move his shanty off.

Q. But in those cases those sand bars are formed imperceptibly and gradually?

A. Not very suddenly.

Cross-examination.

By Mr. STONE:

Q. Will you describe the character of the soil or material that composes the main body of the Missouri bottom lands adjacent to the river?

A. It varies; a great deal of it is silt formations and old river beds. A cross-section, any place across this bottom, will determine some old river bed, and there will be places where there is a thing we call "gumbo." It is very tough. Another clay that is naturally soft and easily permeated, and on the top, owing to the age

118 it has been growing, grasses and trees, will be a loam, rich soil, and below all there is again cotton-wood trees, old drift, and sand, and naturally in that bottom is a conglomeration of a little of everything in it. There is a good plastering sands deposited. There is gumbo, that you cannot do anything with, tougher than putty, and so it is alternated, and for ages it has been there and the floods going over it. Everything in sight looks like natural

soil, but you study the bank and you will find everything within a few rods or miles.

Q. Now, Mr. Smith, explain, if you please, why it is that such soil or material as that is easily changed by the action of the water, and why it is that the river bed of this stream may shift and change so easily.

A. Sand won't stand perpendicularly. Any quicksand, any decomposed rock that is reduced down to sand, the best you can do with it is about 45 degrees elevation, and agitation of the water will dissolve it and carry it away, and it is bound to go into the river. It is not a permanent native soil like the clay bluffs which you see on either side, which would stand the pressure of water a longer time than this porous conglomeration of quicksand and silt.

119 Q. Do you know how deep it is from the surface of this bottom or material down to where this material is permanent?

A. I would give you a record of the building of the Union Pacific bridge. When they put down one of their piers for the first U. P. bridge they found a pine log a foot and a half in diameter upon the bed-rock 65 feet below the surface of the water; so it seems to be some depth. I never dug holes, but I have helped the boys feel for rock with these long rods. They would go on through quicksand and then soft and easy until you could not lift the rod any more looking for rock. It is that kind of deposit down 65 feet or more down to bed-rock. You have a regular stone reef up here (witness pointed to section 10, Nebraska Exhibit "C"); comes near to the surface, but in general there is that deposit of that kind of stuff.

Q. Now, these changes made by the current of this stream are made more rapidly after a flood which saturates the soil?

A. That is my observation. They would drop more readily after one week's flood that had flooded the whole bottom. We had such in 1857, 1867, and about 1877—a little before. Yes, it was 1877; it was one of those floods that made the cut-off.

Q. Were those exceptionally large floods?

120 A. Yes; those were extraordinary large floods that would trespass upon bottom grounds.

Q. Then you have the smaller freshets that will fill the banks of the streams?

A. Sometimes the bayous.

Q. About how often did you have these ordinary freshets?

A. Every June there *us* about a bank-full flood; the flood of 1881 was a break-up ice flood occasioned by a gorge above here brought a super-colume of water down here abruptly.

Q. Are you able to estimate about how much land would be formed against the Nebraska shore within this area that you are discussing within any one year during the period from 1857 to 1877?

A. The best I could do would be an average of the years at the time — Government acted, and afterward, to check its abrading, there was some riprapping done here (witness here pointed to the Iowa shore in N. W. $\frac{1}{4}$ sec. 28, Iowa Exhibit "C") and some planks put in there; probably stopped its average of one year. I could not

tell, except to go back to 1856. Here (witness pointed to meander of 1856, Exhibit "B") was our bank, and go back to 1851 and here (witness pointed to meander of 1851, Exhibit "A") was the Iowa bank; it is here (witness pointed to channel as shown on Exhibit "C") to-day; here has been 36 years passed, I should judge would be that it came along about in average years.

Q. At this time is it not a fact that the river has run pretty
121 much all over that bottom, taking it from bluff to bluff north of Council Bluffs and Omaha?

A. Not in this time; in times past this bottom has been traversed by the Missouri river or some river, but during my residence here since the Government made its survey here it has only made its change by abrasions, with this exception, and one at Rockport, and one at a mill in Douglas county, or in Pottawattamie, at Lake Manawa.

Q. What I want to get at is whether or not in your residence here almost the whole of this bottom, say from the east side of sec. 22 on the Iowa side nearly to the bluff on the Nebraska side, has been washed by the Missouri river along the line on the north side of 20, 21, and 22?

A. This fractional 20, 21, and 22, you have referred to them. Now I will tell you. Here, about where my finger runs, along where Bousch used to live on this bank here (pointing to the centre of the north half of sec. 22, in Iowa, Exhibit "C"), in extraordinary high waters our ferry-boat had to run this channel (witness pointed to main channel of river shown on Exhibit "C") and take its landing; it has traveled from the east; a number of floods it traveled this (witness pointed finger along long bend of river through to sec. 20 and 21, Iowa, and 1 and 2, Nebraska) long distance around to higher prairie, at near this high bank, where it came around here (witness pointed to N. E. ¼ sec. 22, Iowa Ex. "C"); passengers could go to
Council Bluffs and back and get to the ferry-boat for a week
122 or two at a time, and the stage would run for passengers down by Dr. Smith's here (witness pointed to centre of sec. 10, Neb. Ex. "C"), and they would run out Farnam street here and sometimes that bank would be inundated and they would land at the sulphur springs up here. Now, there was very high ground and over there was high ground and the ferry-boat would make its trips there when this part of the land was inundated. The ferry-boat would run from the centre of sec. 10 on the Nebraska shore up the main channel of the Missouri river to about the centre of the east and west half of sec. 22, 75, 44, Iowa. The river in 1856 had got about here; Bousche lived there. In lot 1 of section 22, 75, 44 there was good high prairie and a nice farm over here. The ferry-boat would run and land its passengers here.

Q. I believe you stated that you never noticed just how rapidly this new land was made?

A. No; I always assumed it was doing it all the time, night and day.

Q. And more rapidly in each year after a freshet?

A. That usually softened the ground and it seemed to get a little

more abrupt in some places. I camped on the borders of it in Washington county and saw it cut off; when saturated with
123 water it would be less stable.

Q. In your experience and knowledge as an engineer, is there any other well-known river — like character in its bottom and shore as this?

A. The Platte comes the nearest it, but nearer than that I know of none.

Q. I refer to your knowledge as an engineer.

A. My knowledge as an engineer only extends to the Cedar, Iowa, Mississippi, Missouri, and La Platte, and the La Platte and the Missouri will beat them all; the Mississippi has, within my knowledge of it, within the northern latitude here, has good banks here.

Q. As a student of the art of civil engineering and a reader of books and papers on that subject and of the character of the streams and great rivers of the world, is there any other stream of like character with this?

A. I do not think I have read of any that can claim the dirty tricks of the Missouri river.

Question by Mr. GREENE:

—. How about the Nile?

A. I have no knowledge of the Nile.

GEO. SMITH.

Adjourned to Friday, Sept. 7th, 1891, at 10.00 a. m.

124 OMAHA, NEB., FRIDAY, *Sept.* 7, 1891—10.00 a. m.

Pursuant to adjournment the further taking of the testimony in State of Nebraska *vs.* State of Iowa was resumed at the above time and place.

J. A. SWOBE, called on behalf of the plaintiff, being duly sworn, testified as follows:

Examined in chief by Mr. GREENE:

Q. What is your age and residence, Mr. Swobe?

A. 52 years old; Omaha.

Q. How long have you lived in Omaha?

A. Since 1867.

Q. Since 1867?

A. Yes, sir.

Q. Are you acquainted with the Missouri river between Omaha and Council Bluffs?

A. Yes, sir.

Q. How long have you known it?

A. Since 1863; lived on the Council Bluffs side of the river.

Q. What is your business now?

A. Conductor on the U. P.

Q. What was your business for a number of years prior to your employment by the U. P.?

A. Worked for a ferry company; hauled wood from 1863 to 1867 on the Iowa side of the river.

125 Q. And what did you do from 1867 on?

A. Run a ferry-boat from 1867 to 1877.

Q. Where?

A. Between Omaha and Council Bluffs, on the Missouri river.

Q. Look at this map or tracing (showing witness map), marked Exhibit "B," and state where the Missouri river was located in '63, with reference to its location as shown upon this exhibit.

A. Well, in '63 I didn't take any particular notice of the river. I shouldn't think it was far from where it is there. (Witness refers to map.)

Q. In what respect would the location of the Missouri river in 1863 differ from its location as shown upon the exhibit?

A. Well, I should think it would be a little straighter along here at that time (referring to point on map).

Q. You mean that when you knew it it would come further down here (referring to point on map) and up here?

Question withdrawn.

Q. You know where the river was located in 1863, do you not?

A. Yes, sir.

Q. Now, state what changes were going on in the location of the river at that time and thereafter.

A. Well, it was cutting in.

126 Q. Cutting in then to section 2 on the Nebraska side, and what else?

A. Cutting in gradually in the bend on the Iowa side of the shore.

Q. What changes were taking place at that time and continued to take place thereafter?

A. Cutting into section 2 on the Nebraska side of the river and filling in over here (witness pointed to Iowa shore opposite section 2, Nebraska Exhibit "B") on the Iowa side.

Q. Now, where was it cutting up here in section 22—into Iowa or Nebraska?

A. Cutting into Iowa in that bend into Iowa—section 22.

Q. How long did it continue in those two places?

A. Kept on cutting every year.

Q. For how long?

A. Kept on cutting until it went through in '77.

Q. As it cut into Nebraska—into section 2 and that locality—what was going on right opposite?

A. It was filling up opposite.

Q. As it was cutting into the locality of section 22, in Iowa, what was going on on *on* the opposite side—on the Nebraska side?

A. It was filling up on the Nebraska side.

Q. What were you doing from '63 to '67?

A. I was hauling wood; had charge of the ferry company's wood yard.

127 Q. Where was the ferry company's timber land?

A. It was cut from along the river. We had timber lands along the river, and all the timber we bought along the Iowa side.

Q. When did you buy them?

A. In the winter of '66 and '67.

Q. Where was this strip of timber you bought located?

A. Along the bank of the river.

Q. How wide a strip?

A. Several rods wide.

Q. How did you come to buy it? For what reason did the owners sell it?

A. Because the river was cutting into it.

Q. Did you superintend the cutting and hauling of it?

A. I did the hauling.

Q. As you hauled it did you observe the river?

A. The river was cutting in.

Q. How does the river cut into a shore?

A. Well, it undermines it and falls in; the river undermines the bank and the bank falls in.

Q. You continued to have charge of that wood yard until '67 for the ferry company?

A. Yes, sir.

Q. What did you do after '67?

A. I run a ferry-boat.

Q. In what capacity?

A. As captain.

128 Q. How long did you run the ferry-boat?

A. Until '76, the last we run.

Q. The year before the cut-off?

A. Yes, sir.

Q. And during the years, then, from '67 until '77 you were operating the ferry-boat on the river?

A. Yes, sir.

Q. Now state whether or not the changes in the river which you have described continued during those years. Were they slow and gradual or were they sudden?

A. Slow and gradual.

Q. Did any sudden cut-off occur during those years?

A. No, sir.

Q. When, then, did the first cut-off occur, to your knowledge, in this locality?

A. In '77, in March—no; February it was.

Q. Which of them was that?

A. That was where the river come together.

Q. In what condition did it leave the lake channel—cut-off lake?

A. Left the old channel there; still water.

Q. Did the current of the river leave the channel and take the new channel?

A. Yes, sir.

Q. When do you remember of last seeing the neck of land through which the water came?

A. I saw it in the summer of '76. I run a ferry-boat there
129 all the time; went across every week.

Q. How far across there was it?

A. Not over 300 yards; not over 200.

Q. What about the changes of the channel of the river, in the river bed, from time to time—what changes occurred?

A. Well, it would be a sand bar in the river; kind of rolled, kind of changed from place to place.

Q. Then the current of the river changed from time to time?

A. Oh, yes.

Q. Do you use the word current and the word channel synonymously?

A. Yes, sir.

Q. Now, when these changes of the current of the river or channels of the river occurred, did they immediately and directly affect the shore?

A. Where the channel runs against the shore.

Q. Would any change of the sand bar or current of the river affect the shore?

A. No.

Q. What is it that changes the shore of the river?

A. The water running against the bank.

Q. I suppose that w-ere the channel of the river changes that it may force the water against the bank at some other point than where it has been striking?

130 A. Yes, sir.

Q. What effect has an overflow in regard to forming land or accretions?

A. It don't have any effect in forming land; will leave a deposit of sand.

Q. Now, illustrate that.

A. Wherever the river overflows the land, when the river falls the water leaves there a deposit of sand; a deposit of sand will settle there, but there has got to be a bar there.

Q. How are bars formed in the ordinary stages of the water?

A. When the river is cutting on one side — generally forms a bar on the other.

Q. Why is that so?

A. Because it is formed—one side of the river caves in and fills up on the other; washes the sand there.

Q. Where is the river the most active—where it is cutting in or the opposite side?

A. Where it is cutting in.

Q. Where it is cutting in the water is in more commotion?

A. Yes, sir.

Q. What is the character of the water generally on the opposite side?

A. Still.

Q. Well, is it universally true that where the current of the river is striking against the shore that the waters are comparatively still on the opposite shore?

131 A. Yes, sir.

Q. And that is what causes the deposit to go on?

A. Yes, sir.

Q. While you were running the boat from '67 to '77 state where you landed it and what you did in — about these lands in controversy.

A. Well, in '67 we run up along this point and clear up opposite Council Bluffs. We had very high water in '67, *one* June and July.

Q. Up in what section of land—where?

A. Just at the foot of that lake—just at this side of section 22—and landed up there and run back.

Q. Where was the water at that time—you say high water?

A. All over the bank; only a piece of land there is section 22 that was out; was a brick yard there.

Q. How was it down around the transfer depot?

A. Nobody down there, but was overflowed.

Q. So in the high floods of '67 the entire bottoms between Omaha and Council Bluffs overflowed?

A. Yes, sir.

Q. Now, when those waters subsided what changes had taken place in the character of the surrounding land?

A. No particular change.

132 Q. Did you notice any change in the general features of the contiguous land?

A. Not until the water got up and fell.

Q. Was the river after the water fell in about the same place as it was before?

A. Yes, sir; before it went over the banks.

Q. Did you navigate the channel of the river before the rise?

A. We went up there before the water was above the banks.

Q. Did you navigate it after the waters had subsided?

A. No; not after the waters went down.

Q. Did there occur any formations there at that time, during that flood?

A. Some deposit left on the land? *A.* Yes, sir.

Q. Did the river retreat to its old channel after the flood?

A. Yes, sir; gradually fell.

Q. Now, when did you have another flood, if you remember?

A. That was in '67. I am not certain, but think '70 or '71.

Q. Could you look that up?

A. I think about '70.

Q. There was a flood about that time?

A. Yes, sir; about '70.

Q. What was the character of that flood?

A. Well, it went over the banks; not as high as in '67.

133 Q. Did it overflow the banks between here and the transfer depot?

A. Yes, sir.

Q. Were you running a boat at that time?

A. Yes, sir.

Q. Where did you make your landings during that flood?
A. Well, we landed at the foot of Broadway, in Iowa, and landed on a sand bank near telegraph pole in Nebraska.
Q. Where you land on the other side?
A. About the foot of Broadway.
Q. What do you call the foot of Broadway?
A. Down there at the end of this here wagon bridge, where Broadway is paved.
Q. Now, when that flood had subsided had there been any marked change in the character of the land?
A. No, sir.
Q. Any formations of land?
A. No, sir; just deposits where the river had left. The river never gets much over the bank.
Q. When does that occur?
A. When the river is falling; about half full.
Q. During an overflow the waters spread out over the country?
A. Yes, sir.
Q. Now, about when was the next flood—do you remember?
A. Well, we had a pretty big flood in '81.
134 Q. Well, then, during the fifteen years that you were working for the ferry company, attention to the wood or running the boat, you recall only these two floods that you have named where the water spread out over the country?
A. Yes, sir.
Q. When do the high waters come in the Missouri?
A. April and June.
Q. Are there two in the year?
A. Generally high in April and the June raise.
Q. What is the character of the June raise—what changes occur during those raises—the June and April raises—in the general character of the river?
A. Overflows the low lands.
Q. Where it overflows does it leave deposit?
A. Yes.
Q. During these high stages that you speak of is there any cutting of banks?
A. No, sir; don't cut much when the water is over the bank.

Cross-examination.

By Mr. STONE:

Q. Captain, at these times when you were hauling wood from the Iowa shore you say the bank was falling away?
A. Yes, sir.
135 Q. Did your company buy this land from which they were cutting the wood in the strip near the river?
A. Yes; they bought the land.
Q. Bought the wood and cut that strip off?
A. They bought only one year up there—the year of 1867; they bought the strip of timber along the river.

Q. How wide a strip?

A. I do not know; it was a couple or two or three hundred feet wide.

Q. Did they buy another strip after that?

A. No; they took all the good wood there was up along there; there was lots of willows along there.

Q. How long was that two or three hundred feet strip falling in; did it all fall in that year?

A. Yes; I think it all fell in that year.

Q. And it formed on the other side?

A. Yes, sir.

Q. How long was that strip?

A. O, it was, maybe, half a mile; maybe ¾; quite a long strip; might have been a mile.

Q. Along the Iowa bank?

A. Yes, sir.

Q. Mainly cotton-wood.

A. Yes, sir; cotton wood and big willows.

Q. This wood you hauled was to be used for firing on your boat, was it?

136 A. Yes, sir.

Q. I will ask you first, Captain, about this area of land on the north of the river where it now runs and on the east of the river as it was before the cut-off in 1877. There is about 2,000 acres of land, approximately, in that area, is there not?

A. Yes, sir.

Q. Now, were you familiar with this bottom and the country in here from 1863 to 1867?

A. Yes, sir.

Q. Were you familiar with the meander line prior to that time—1863?

A. No, sir; I came here in Sept., 1863.

Q. Well, now, from the time you first knew it, in 1863, until the present time, nearly all of that 2,000 acres of land was at some time or other overrun by the Missouri river, was it not—by the regular channel?

A. Yes, sir.

Q. That is, it so changed from time to time that from 1862 until the present the river was somewhere or other on that area of ground?

A. Yes, sir.

Q. Now, you say you were familiar with that country over there where this land being made in this 2,000 acres. Were you?

A. Yes, sir.

137 Q. And it was made, as you say, by the falling away of several hundred feet per year on the Iowa side and filling in as rapidly on the other shore?

—. ——.

Q. Now, is it not true that a great deal more of this ground would fall in in some parts of the year than in other parts of the year?

A. Yes; it would fall in at a certain stage of the river.

Q. Is it not true that most of it would usually fall in in the spring—say from March until July?

A. Yes; in July and August. It would fall in pretty nearly all the year—cave in. The current laid in against the Iowa bank.

Q. It would always deposit as rapidly on the Nebraska shore as it washed away on the Iowa shore?

A. Yes, sir.

Q. Leaving the width of the stream about the same?

A. Yes, sir.

Q. Were you familiar during this period with the processes that were going on west of this 2,000 acres, between this 2,000 acres and the city of Omaha? I mean that part of the land that lies within this great bend as it was prior to the cut-off in 1877.

A. What do you mean—was I familiar with that land?

138 Q. With the changes in the river up there.

A. Yes, sir.

Q. I will ask you if it is not true that from 1863 until the present or until 1877 the Missouri river did not run at some time or other over all or about all the space south of a line from the northeast corner of section 10 on the Iowa shore to the northeast corner of section 10 on the Nebraska shore south to where the river bed is now, whether the Missouri river itself did not run over every portion of it or nearly every portion of it some time or other during that period.

A. Well, I think it did.

Q. This is true except as to three or four hundred acres in section-21 and 29?

A. Yes; that is so.

By Mr. GREENE:

Q. In this process by which the Missouri river worked over the land referred to in your cross-examination is it not true that the river was cutting south into Iowa in sections 21 and 22 and north into Nebraska in sections 1, 2, and 3 at the same time?

A. Yes, sir.

Q. Contemporaneously?

A. Yes, sir.

Q. And that it continued to cut north into Nebraska and south into Iowa until 1877, when the cut-off occurred?

139 A. Yes, sir.

Q. How wide was this strip along here, do you know, that you bought for wood?

A. It was about 300 or 400 feet wide.

Q. You commenced to cut wood there when?

A. In the winter of 1866 and '67.

Q. And hauled it off in the spring?

A. Yes, sir.

Q. And during this time, the winter and spring, the river was cutting pretty strongly there?

A. Yes, sir.

Q. And in the course of a year it cut out a large portion of the strip?

A. Yes; I think a large portion of the strip went out that season.

Q. That was a season there was a great deal of water?

A. Yes, sir.

Q. Big flood?

A. Yes, sir.

Q. And both before the waters overflowed the bank and after they had subsided into the banks this cutting occurred?

A. Yes, sir.

Q. There were other season- when the cutting would not be so strong?

A. Yes, sir.

Q. But all the time it was constantly going on?

A. Yes; gradually cutting.

140 Q. You say in cutting the river undermines the bank so that the surface falls in sometimes?

A. Yes; that is the way it cuts.

Q. The river has a tendency to preserve its length and width?

A. Yes, sir.

Q. As it would cut and undermine and the banks fall in the main body of the water would hug the Iowa shore?

A. Yes, sir.

Q. Leaving upon the Nebraska shore still water?

A. Yes, sir.

Q. And there would be there a constant deposit of the material and silt held in suspension by the water?

A. Yes, sir.

Q. So that while pieces of dirt might fall in upon the Iowa side the formation of the land upon the opposite side was a slow and imperceptible process, was it not?

—. ——.

Q. By deposition?

A. Yes, sir.

Q. What was true in this locality was also true in the vicinity of sections 1, 2, and 3 in Nebraska?

A. Yes, sir.

Q. And in 20 and 21 in Iowa?

A. Yes, sir.

Q. Did chunks of dirt go across the river?

141 A. No, sir; I do not think they floated over.

Q. When a chunk of dirt falls in does it not become dissolved and its constituent elements float down the river as mud?

A. Yes, sir.

Q. What is cut at the time the cutting goes on the one side and the depositing on the other is the material that goes down the river?

A. Yes, sir.

By Mr. STONE:

Q. When you say it was slow and imperceptible you simply give your opinion that it was slow and imperceptible?

A. Yes, sir.

Q. You do not know what the law is as to what is slow and imperceptible; you do not mean to swear to what the law is; in your opinion it is simply slow and imperceptible?

A. Yes; as the river cuts out on one side it advances on the other.

Q. And if it is not over a dozen or fifteen feet a day you would regard it as slow and imperceptible?

A. Yes, sir.

Q. You regard the advance of the hands upon the face of a clock as imperceptible, but it gets a good many feet in the course of 24 hours?

A. Yes; it gets there.

142 Q. You do not see the particles of soil deposited?

A. No, sir.

By Mr. GREENE:

Q. But you may after measuring from time to time discover that land has grown there—that is what you mean?

A. Yes, sir.

Q. Whether imperceptible means what the law means you do not define it, but what you mean you do?

A. Yes, sir.

By Mr. STONE:

Q. When this dropping of the Iowa shore occurred in 1866 and 1867 at the rate of 300 or 400 feet a year you call that imperceptible, do you?

A. You go there every day and you would not see any change.

Q. I am simply asking if you would regard that as imperceptible?

A. No; we could see it was going—cutting away there all the time.

Q. All the time?

A. But not very fast, just gradually cutting.

Q. That was really perceptible?

A. You go away two or three weeks and go back you would see quite a change.

Q. And it was added to rapidly on the other side?

143 A. Yes, sir.

Q. And you could see the same changes there?

A. Yes; see the bar going out.

Q. You go on the Iowa side you might see a chunk fall in?

A. Yes, sir.

Q. But did you see any chunks form on the other side?

A. No, sir.

Q. That was a slow and gradual process?

A. Yes, sir.
Q. That was made by depositing small particles of dirt?
A. Yes; that must come from above.

JOHN A. SWOBE.

W. W. MARSH, of lawful age, being first duly sworn upon behalf of plaintiff, testified as follows:

By Mr. GREENE:

Q. State your full name, age, and residence.
A. W. W. Marsh; age, 59 years; residence, Omaha, Nebraska.
Q. What is your present business?
A. I am president of the Council Bluffs & Nebraska Ferry Co.
Q. I would like to have your general business.
A. I am president of the Gedney Pickle Co., president of the —— Union National bank, treasurer of the Omaha Street
144 Railway Company.
Q. How long have you lived in Nebraska?
A. In Omaha, since February, 1863; in Nebraska I have lived since 1856.
Q. How long have you been acquainted with the Missouri river in the vicinity of Omaha and Council Bluffs?
A. Since the first of January, 1863.
Q. What business were you engaged in at that time?
A. I had charge of the operation of the boats on the river.
Q. Nebraska Ferry Company's boats or other boats?
A. Those and the Union Pacific and Missouri River transfer.
Q. What is the name of your company?
A. Council Bluffs & Nebraska Ferry Company.
Q. Were you an officer of that company?
A. Yes, sir.
Q. What office did you hold?
A. President.
Q. How long did that company operate boats on the river?
A. From 1855 to 1877.
Q. And from 1863 to 1877 you were actively at the head of the concern?
A. Yes; had the management of it.
Q. Did your company own land in the vicinity of the lands in controversy?
145 A. We owned a strip of land from section 33.
Q. From the centre of section 33?
A. I think it was from the centre of section 33 to the east and west centre line of 20. We owned that entire frontage there in Iowa.
Q. How wide a strip was it?
A. It varied in different localities; it varied in width; from the narrowest point, I should say, would be an eighth to a half a mile wide.
Q. Did you own any land up in the vicinity of sec. 23 in Iowa?
A. We owned farther north than that.

Q. What section was it?

A. I do not remember. I could not tell the section.

Q. Then you owned other lands about how far up the river?

A. Well, it was about three miles, I should say, from Broadway to our land on the river above what we called the Bousche ferry.

Q. Now state whether you watched with interest the changes in the river bed of the Missouri river during the years that you have referred to.

A. I did.

Q. What general change took place in the channel of the river?

A. A gradual changing of the Iowa side and the Nebraska side, both.

146 Q. Do you know about where it ran in 1863? I will have you look at Exhibit "B," and state with reference to that where the river ran when you first knew it.

A. I cannot swear to the correctness of this map, only, if this is correct, the shape of the river in 1863, when I first came here, was similar to what this represents, with the exception that it had dropped lower down in this locality (witness here pointed to the N. W. ¼ sec. 22, 75, 44, Iowa Exhibit "B"), taking out a portion of the land there, and from the crossing they made over here (witness pointed to section 2, Nebraska Exhibit "B") was more in a northwest direction than that represents.

Q. That is to say, it had cut into section 22, in Iowa, more than is shown in this map, and cut further up in 2 and 3, in Nebraska, more than it shows?

A. Yes; it was gradually cutting in this way all the time.

Q. Now look at Exhibit "C," and state if that shows where the river was in 1877, before the cut-off.

A. The last time I saw the river before the cut-off, this neck of land (pointing to lot 1, section 29, Ex. "C") here, I should say, was about a quarter of a mile wide; it was not cut in quite as far as this map shows, but that was the general course of the river, with

147 that exception; it was not quite as near being cut across as that shows.

Q. When did you see it last?

A. I do not think I saw it. I might possibly have seen it during the year 1876, but it was 1875 or '76. I would not say positively.

Q. At that time it was about a quarter of a mile across and cut through in the spring of 1877?

A. Yes, sir.

Q. And this (Exhibit "C") you think shows the general course of the river as it ran then?

A. Yes, sir.

Q. Now, how was the change of the river from its bed as it ran in 1863 to its location in 1877 worked out?

A. The channel on the Iowa side was always in this (witness pointed — N. ½ of sec. 21 and 22, Iowa Ex. "B") bend every year, to my knowledge, and gradually every year taking a portion of that bank and dropping further south; it was producing the same effect on the Nebraska side (witness pointed to sec. 2 and 3, Nebraska Ex.

"B"), only not so rapidly; it did not cut near as fast on the Nebraska side as it did on the Iowa side, and accretions as it dropped off here were being formed on the Nebraska side of the river.

Q. You say it had dropped south in 22, and accretions were
148 formed on the opposite side in Nebraska?

A. Yes; and as the bend worked north and west.

Q. As it worked up through sec. 1, 2, and 3, in Nebraska, accretions were being formed in Iowa opposite?

A. Yes, sir; accretions were being formed in that bend.

Q. Were there during these years and sudden cut-offs other than the cut-off of 1877?

A. None, that I know of.

Q. The change, then, in the location of the river was a slow and a gradual one?

A. Yes, sir. Well, I would want to correct that. I would say it was gradual, but I do not say it was slow.

Q. I mean as contradistinguished from a sudden change?

A. It was a gradual change.

Q. How would it, for instance, take it where it was cutting into 22, on the Iowa side? How was that process carried on? Describe it.

A. By the undermining of the bank and its dropping in in sections.

Q. And how was the land formed on the opposite side?

A. By deposits of material that was in the water.

Q. Do you remember buying a strip of land along the Iowa shore of the Missouri river?

149 A. I bought some wood off the land.

Q. How wide a strip?

A. I could not say exactly; several rods wide. I do not remember. I know I tried to buy the land for the sake of getting the wood, and he finally compromised and sold me a portion of the wood. It was young cottonwood timber.

Q. That was on surveyed land?

A. I believe it was. I bought it of a man who claimed to own the land.

Q. When was this, Captain?

A. I could not say the year exactly; somewhere from '65 to '68.

Q. What became—after you cleaned off the wood—what became of the land?

A. It gradually went into the river.

Q. Do you know about how gradually?

A. I could not say the length of time it — for it to go in.

Q. What about floods? What floods do you remember during these years?

A. We had several floods when we had water over the bottom.

Q. What do you mean by bottom?

A. I mean portions of the bottom. There is a low place between the foot of Broadway and the Northwestern depot; one locality where there is a draw across there, where it is low, and frequently we would have water there, where it would swim a horse, and other points would not be inundated.

150 Q. What other floods did you have?

A. About the year 1867 we had a big flood, but not enough to cover the entire bottom.

Q. One of the largest floods you had in those years.

A. One of the largest we had while I was operating the ferry; we have had a larger flood since then.

Q. That was 1881?

A. Yes, sir.

Q. Since then?

A. In 1857 it was about the same, maybe not quite as deep water.

Q. Then in 1867 this large flood came and the waters afterwards subsided. Now, what change was brought about during that flood in the character and formation of the land?

A. I noticed no change during the flood. I do not think the Missouri river bank washes while the water is out of bank.

Q. I suppose when the waters overflow they leave deposits?

A. Wherever the Missouri river water gets still she commences to settle.

Q. Where there is cutting going on one side, no matter however rapid or slow, the water is still on the opposite shore?

A. Yes; the current is always on the side where the cutting is going on.

Q. And wherever the water is still deposits take place?

A. Always.

151 Q. Do you know of any floods or overflows where the river overflowed the banks that produced any noticeable change in the general features of the river or country?

A. Never have known of any.

Q. There are more or less sand bars in the Missouri river that are constantly changing and shifting, are there not?

A. There are plenty.

Q. These changes do not directly affect the banks one way or the other?

A. I should think it would be the banks that would make a change in the sand bar instead of the sand bar making a change in the bank.

Q. The bank might deflect the water?

A. Change the location of the water and the sand bar on that account.

Q. But changes of the sand bar do not of themselves necessarily affect any particular point of the bank?

A. I do not think they would.

Q. Might change the current of the river so as to put it against the bank in some other place; it is the cutting of the water that affects the bank, is it not?

A. Yes, sir.

W. W. MARSH.

THOMAS TOSTEVIN, sworn on the part of the plaintiff and examined in chief by Mr. C. J. GREENE, testified as follows:

152 Q. You reside in Council Bluffs, Mr. Tostevin?

A. Yes, sir.
Q. What is your official position?
A. City engineer of Council Bluffs.
Q. How long have you held that position?
A. Several terms—some six years.
Q. How long have you known the Missouri river in the vicinity of Council Bluffs and Omaha?
A. Since April, 1854.
Q. You came there, then, three years after the meander line of Iowa was run?
A. Yes, sir; it was run in 1851.
Q. You were in Council Bluffs at the time the Nebraska meander was located?
A. Yes, sir.
Q. State what change had occurred in the river during these years. In what direction had the river worked in the vicinity of sections 20 and 21, in Iowa?
A. Was working northwest in that locality.
Q. In what direction at section 22, in Iowa?
A. Southward.
Q. What distance had it worked in that locality opposite section 21 during the five years following 1851?
A. It had moved a distance over half mile northward.
153 Q. How far south had it moved into section 22 in that time?
Q. In the three years about the width of the river—about 1,300 to 1,400 feet.
Q. Now, in '56 was there not a pretty sharp angle about the north and south centre line of section 22?
A. Yes; as defined by the Government survey, there appears to have been at that time quite an angle in the river.
Q. In what direction did the river flow before making that angle?
A. Southwesterly at that point.
Q. And from that point on down which way did it flow?
A. North of west.
Q. Then at the bend in section 22 the river was cutting into section 22, was it not?
A. Yes, sir; it was cutting southward through 22.
Q. Now, the river ran from that point to near the dividing line of sections 2 and 3, in Nebraska, did it not?
A. Yes, sir.
Q. And then made what sort of a turn?
A. It turned almost abruptly south.
Q. Now, what would be the effect of cutting in on the angle of deflection; would it render it more obtuse or acute?
A. I think acute, as the river never moves in absolute
154 angles—that it must have a smooth round contour until it had reached the maximum point, until just before the cut-off occurred.
Q. What I want to know is, whether after cutting off at the head

of the bend here, would it not have a tendency to force the head of the current back all the while?

A. Well, I think we would have to rest on observation in that matter. I would not know how to draw a theory, unless from observation.

(Question withdrawn.)

Q. How long did this cutting continue into the Iowa and Nebraska shores?

A. I think it occurred up to the year 1877.

Q. Then what occurred?

A. There was a sudden cutting off of the land. The two channels met at this point down here, leaving the old bed of 1870 as a bayou.

Q. Then from 1851 to 1877 the river was cutting south in 22 on the Iowa side and north in the vicinity of sections 1, 2, & 3 into the Nebraska side?

A. Yes, sir.

Q. Until 1877, when the river ran in the shape of a horseshoe, as shown on "Exhibit C"?

A. That is about the shape.

Q. Will you look at "Exhibit C" and state if it is about as correct as could be had.

A. I would not define it as absolutely correct, but it is a fair approximation.

155 Q. As near as it can be got?

A. I would say — from appearances. I have made maps and could tell better by them whether it corresponds with the surveys I have made. It apparently bears a close relationship.

Q. During the time, then, it was cutting into the Iowa side, what was transpiring on the opposite side?

A. It was cutting into Iowa right there.

Q. It was forming over on this side new land?

A. Yes, sir; in proportion to the erosion.

Q. That is to say, the river has a tendency to keep its width?

A. I think it does.

Q. That same process was going on below?

A. Yes, sir.

Q. It was cutting away from Nebraska and building on to Iowa?

A. Yes, sir.

Q. Is it true the Missouri river generally maintains its width and length through all changes? Is not that the theory?

A. Yes; I believe that to be a fact.

Q. Now, when the river was cutting into one shore, what was the character of the water against the other shore in regard to its being in commotion or still?

A. It is not so violent as it is in the current; it is not still water.

156 Q. While the river is cutting into one shore generally the bulk of the current is on that side of the river?

A. Yes, sir.

Q. That is where the water is in the greatest commotion or state of activity?

A. Yes, sir.

Q. On the opposite shore, at the same time, it is not as active or in as great state of commotion?

A. The commotion is not so rapid.

Q. And it may be still, may it not?

A. Very seldom.

Q. Flowing quietly?

A. Yes, sir.

Q. Where, then, would be the greatest deposits?

A. Where the water is the least interrupted; less violent in its action.

Q. Now, where the river was cutting into Iowa there would be a constant deposit to Nebraska?

A. I think it would be in exact proportion to the erosion on the opposite side.

Q. Have you made any surveys along up here in this locality?

A. Yes, sir.

Q. When did you make your first survey up here?

A. I have made surveys off and on for thirty-odd years.

Q. Now, you were always surveying on the Iowa side, were you not?

A. Yes, sir.

157 Q. Have you surveyed on the Nebraska side?

A. I believe I have made no surveys on the Nebraska side until recently.

Q. Where you surveyed last on the Nebraska side of the river it was on the Iowa side then, was it not?

A. I have made surveys on that shore when I could walk in dry-shod to Council Bluffs.

Q. Then you were always on the east side of the river, were you?

A. Yes, until lately. I have made surveys on this side and embracing the entire territory.

Q. During the early days?

A. Yes. I do not remember of making surveys of the Nebraska side during the early days.

Q. Now, when did you first come on this land for the purpose of surveying?

A. 1854.

Q. Where was the river then?

A. It was in here, where it is divided by this meander.

Q. When did you again survey?

A. Kept surveying it along here at intervals, the Busha farm and all this ground, before it was disturbed any.

Q. Did you do that about the time the Government surveyed Nebraska and ran the meander line?

A. Yes, sir.

158 Q. Do you know whether that is substantially correct or not?

A. I believe it to be substantially correct.

Q. Did you make any survey in the sixties down here for the purpose of ascertaining how far the river had cut in sec. 21 & 22?

A. Not for that purpose.

Q. Did you incidentally observe it?

A. Yes, sir; I observed it.

Q. Give us the earliest time.

A. At the time of the John I. Blair and W. W. Walker representing a land company in the West, purchased what has been known as the Blair tract—their 320.

Q. What section was that?

A. Section 22, in the south half.

Q. What date?

A. I cannot fix the date; about the time the Northwestern came into Council Bluffs—1867.

Q. About how far south had the river cut into sections 22 & 21?

A. It had not commenced its surface innovation yet on this tract—the south half of 22.

Q. It had progressed somewhat?

A. Yes, sir; somewhat.

Q. About how far into the south half of 21 and 22?

A. I am not able to fix the exact line, but it was nearly intact that they bought it for half section. It is my impression that they bought it at Government size.

159 Q. It had cut some in 1866 and '67?

A. Yes, sir.

Q. When did you go again for the purpose of surveying?

A. I do not remember that I ran any lines there until, perhaps, 1880.

Q. From 1867 until after the cut-off you had no surveys down there?

A. No, sir; I made no surveys up there from 1867 to 1880.

Q. So that from 1851 while there was cutting there it had not been to any great extent. How far would you put it?

A. Well, I should think it would exceed—I can only say this: It had left the large part of that half section—what was called the Blair tract—undisturbed. I could not say it had come down much more than a quarter of a mile.

Q. Are you certain about the date?

A. No; not absolutely.

Q. It might have been earlier than 1867?

A. I cannot say.

Q. Can you find out?

A. I can find out the time that company was formed.

Q. You locate the time at about the time the Northwestern came into Council Bluffs?

A. I think that was in 1867.

Q. That was the last survey you made or the last time you went over the ground, was it not?

160 A. I think it was.

Q. What did you do after 1867—what business?

A. I was engaged in other occupations in the Bluffs; part of the time I was away.

Q. What part of the time?

A. I was in the Bluffs from 1867 until 1870, and I was mayor of the city during the interval, and I was also alderman, and from that time until '77 I was in Utah as U. S. deputy mineral surveyor, and I was then engaged in the United States survey of mines. Afterwards I went to New York city and stayed three years, and resumed my business in Council Bluffs in 1880.

Q. From '70 until after the cut-off you were not in the place?

A. No, sir.

Q. From '71 to '74 you lived in Utah and from '74 to '79 you lived in New York?

A. No, sir; I was in the Bluffs from November, '74, to 1876.

Q. During this time you were in the Bluffs you paid no attention to this up here?

A. No particular attention. I was frequently on the banks.

Q. It was then cutting, was it not?

A. Yes, sir.

Q. How far had it cut down in 1876?

A. I am not able to fix the exact point by measurement.

161 Q. Could you approximate it? Give us your best idea.

A. Up to 1876 my observation at that time—at the time of the cut-off I was not here; I was in the city of New York. I cannot tell absolutely what month now I went to New York, but think it was in the fall of 1876 and the cut-off occurred in 1877.

Q. What I am getting at—you say you came back from Utah and was in the Bluffs?

A. Yes; I used to observe the change with interest.

Q. What changes had transpired here in 22 up to that time?

A. I would not fix the shore line at any given date, because I could not do it with definiteness.

Q. Was it cut considerably south of where it was?

A. Yes; some.

Q. A mile or more?

A. As I say, I would not commit myself to any distance.

Q. As a matter of fact, it had cut down there where it is shown by Exhibit "C," and then it cut through in 1876?

A. Yes; I think there is no doubt about that; it has traversed that entire territory.

Q. And all the lands on this side of the river as it runs now—south of the old meander line of Iowa—has been formed by deposits of material by the waters of the Missouri river against the

162 Nebraska shore, has it not?

A. It has been removed and replaced by the action of the river and formed by deposits by washing up and depositing the sands.

Q. The same process shown here has gone on all along the river by washing sands against the Nebraska shore and by deposits of sand held in suspension by the waters?

A. Yes; there is no doubt after the basis has been formed.

Q. After the basis had been formed overflows would increase its height?

A. Yes, sir.

Q. That would be true upon the old surveyed land?

A. Yes, sir.

Q. So overflows do not effect these new formations any different from old land that was surveyed in 1851?

A. No, sir; I do not think there is any difference in that effect.

THOS. TOSTEVIN.

OMAHA, NEBRASKA, *September 25th*, 1891.

By agreement of the parties hereto, the further taking of evidence on behalf of the complainant, The East Omaha Land Company, was resumed.

JOHN P. MCPHERSON, a witness of lawful age, being by me
163 first duly sworn to tell the truth, the whole truth, and nothing but the truth concerning the matter in controversy herein, deposeth and sayeth as follows:

Examined by C. J. GREENE, Esq.:

Q. State your age and place of residence.

A. My age is 55 years, and my residence is Greenwood, Cass county, Nebraska.

Q. Are you acquainted with the Missouri river in the vicinity of Omaha and Council Bluffs?

A. I have been for a great number of years.

Q. When did you first become acquainted with it?

A. In the spring of 1856.

Q. What was your business for a great many years?

A. My first business on the river was the running of a ferry at Omaha, in charge of a boat and piloting.

Q. That is the ferry across the Missouri?

A. Across the Missouri, between Omaha and Council Bluffs.

Q. State whether or not for many years you acted as pilot.

A. Yes, sir.

Q. That was your business?

A. That was my business; in the ferry most of the time, and then afterwards I came down on the river on other boats.

Q. When did you leave the Missouri river?

A. In the spring of 1888.

164 Q. Then from 1856 until 1888 you were most of the time engaged on the Missouri river, were you?

A. Every year except one, and not altogether off the river that year; you might say I was not off the river that year.

Q. Did you observe any changes in the course or direction of the river between the time when you first knew it and when you left it?

A. Oh, yes; quite a number of them.

Q. Look at Exhibit "B" and state whether or not it shows the location of the river in 1856 as you knew it.

A. Well, as nearly as my recollection, it does.

Q. Now, state at what points upon the river, as shown on the exhibit, it was cutting.

A. In 1856?

Q. Yes, sir.

A. Well, there was but a very little cutting of the river at that time.

Q. Well, where was that cutting?

A. There was a little along this bank opposite to and below Telegraph point.

Q. I will ask you where Busha's bend was.

A. It was the first right-hand bend above Saratoga bend going up the river. It was in the north half of section 22, in Iowa.

165 Q. And Saratoga bend was in the south half of sections 2 and 3, in Nebraska, was it?

A. Yes, sir.

Q. I will ask you where the river was cutting when you first went to work on it, in 1856.

A. Well, when I first went to work there was very little cutting. I don't recollect so distinctly. There was a little cutting below Telegraph point on the Iowa side, and there might have been, but I don't recollect about that, up in Saratoga bend. I couldn't say whether it was cutting in Saratoga bend in 1856.

Q. On what shore was the current of the river striking in Busha's bend?

A. It struck the Iowa shore.

Q. And what shore did it strike up in Saratoga bend?

A. It struck the Nebraska shore.

Q. Was there any cutting or wearing of either of those shores at that time, as you recollect?

A. My impression there was slightly—not very perceptible—that is, noticeable—unless you extend it all over the whole season; it was very slight at that time, is my recollection.

Q. When did you notice any considerable cutting there in Busha's and Saratoga bends first?

166 A. I don't know that I can give you the exact date on that, but it strikes me as being about—that is, any heavy cutting—probably 1862 or 1863, or along there.

Q. Well, state the extent of the cutting during those years.

A. Well, I could not give you the exact amount; it was from observation at different times and not actual measurements. I could not state definitely. Of course during some stages of high water it cut more than at others and at some seasons more than others.

Q. Can you state for what distance it cut into the Iowa shore in the vicinity of Busha's bend during 1862, 1863, and 1864?

A. I could not give it exactly; I could not begin to. It would be kind of guess-work.

Q. So near as you can.

A. There was times when it seemed to cut the bend—oh, perhaps fifty feet back.

Q. For how long a time did the cutting continue into the Iowa shore?

A. At what point?

Q. Up in either sections 22 or 21.

A. Oh, after big raises it would cut in during the raise and as the water receded back down to the ordinary stage, and then it would not cut much, and perhaps it might wear even some then until the low stage of water, and then there was not much
167 cutting; some seasons, you know, more than others.

Q. What was the final result of the cutting into the Iowa shore?

A. It finally cut until it cut together—the two channels together—and made the cut-off and left a lake in Saratoga bend.

Q. At the time the cutting commenced in section 22 in Iowa what was the fact with reference to the river cutting into sections 2 and 3 on the Nebraska side?

A. Well, it had been cutting there, to-; more so, as this Busha bend got deeper it made the water come more straight at the Nebraska shore, and therefore this Nebraska shore commenced to cutting faster.

Q. Now look at Exhibit "C" and state whether or not that shows the location of the river just prior to the cut-off—say in 1877.

A. It does.

Q. Where were you when the cut-off occurred?

A. I was at my house, on the corner of Tenth and Daveport streets, and sitting on the stoop with a spy-glass watching it.

Q. Do you know within what distance the channel—they called them the two channels—were from each other just before they cut through?

A. I judged it to be about thirty feet; that was my impression from looking at it.

Q. What was going on on the Nebraska side of the river
168 opposite to section 22 in Iowa while the river was cutting into the Iowa shore?

A. That is, in Busha's bend?

Q. Yes, sir.

A. Well, there was a filling process—a making of land on the opposited side. As the river worked south the land seemed to accumulate in proportion all the time on the opposite shore, not to its full height, but in after floods the sediment would keep settling until it got up to the height of the other bank.

Q. And what was going on on the Iowa shore opposite to where the river was cutting into sections 2 and 3, in Saratoga bend?

A. The same thing was going on on that shore.

Q. So that as the river was cutting into the Nebraska shore into sections 2 and 3 land was being formed to section 21 in Iowa?

A. Yes, sir; in this bend; and it seems all the length of the bend in proportion to the cutting on the one side it would form land on the opposite shore, as a general thing, generally speaking.

Q. And as the river was cutting down through sections 22 and 21

in Iowa it was forming land opposite—to the opposite shore of Nebraska?

A. That was my observation of it.

169 Q. Now describe the process of the formation of land to the different shores.

A. Well, it seemed to be done by the sediment of the water settling. The current, leaving this shore and hugging strong to the lower side of the bend, leaves the water slack on the opposite shore and the water settles—the sediments in the water settles—and that seems to be the process of forming land, and then, afterwards, in the next high water, that still settles more. I have known deposits that was two feet deep on the ground in Iowa. I had reference to this land up in here. It was on the land that was owned by the Nebraska Ferry Company. That is the land I had reference to. It was a time they had a lot of wood cut there and piled four feet high, and I seen deposits there that was two feet deep on the wood, and the men came and dug it up afterwards.

Q. Where were the Nebraska Ferry Company's lands—in what sections?

A. The Nebraska Ferry Company's lands were in sections 21 and 28, contiguous to the river—the fractional lots of sections 21 and 28 along the river.

Q. Immediately after a bar or land begins to form to a shore how does its elevation compare to that which had been formed for some time?

A. Well, it is lower.

Q. Now state how that is built up so that in time it is as

170 high as that which had been there for some time.

A. Well, it is made in this season, for instance, and it will remain that way—that is, after the high water is all over for the season it will remain that way until the next season, until another rise comes on, and it will build on again if it comes up over this land and if it don't go away.

Q. What about vegetation on this made land?

A. As soon as it gets so that the bar is out the most of the season, why cotton-woods and willows spring right up on it.

Q. Well, when the high water comes what effect has that vegetation on the water?

A. When the high waters come that retards what little current there is and the sediment settles that much faster.

Q. Then what effect does the wind blowing over the bottoms have towards filling up this made land?

A. Why, if there is anything moving in the atmosphere it will settle as it blows over the bank; it settles like a snowdrift.

Q. You may state, Mr. McPherson, how you designate the different benches.

Q. Well, the first that comes out of the river after the river is down we call that a bar, a sand bar. It is nothing but dirt and sand, and it is lower than the old bank of the river, and then

171 after it gets up so that it makes a bank—that is, cuts off square—we call it the first bench, and if it is not filled up yet

to the old bank that we call the second bench, and sometimes there is a slope that extends over many years that goes back further in the bottom, and we call that the third bench. The probability is that no person in a lifetime has seen one made.

Q. What forces of nature are constantly at work leveling up those benches?

A. It is the extreme high water that overflows those places and by the sediment settling from the water makes these benches.

Q. Does the wind carrying sand and dirt constantly have a tendency to level up these benches?

A. Yes, sir; it may to a certain extent.

Q. The wind carries sand the same as the water does and other sediment?

A. The wind don't carry so much.

Q. But it is constantly at work?

A. Yes, sir.

Q. Could you at any time as you navigated the Missouri river in the vicinity mentioned observe the formation of land to either shore?

A. I could not see it, but I could know of its going on by appearances.

Q. That is, you could not stand and look at it and see it forming?

172 A. No; it was under water. It was out of my sight.

Q. Would you be able to notice, we will say, from month to month or year to year?

A. I would notice it as the water came down off of it—that is, when I actually saw it.

Q. You would see rather the result than the operation?

A. Yes, sir; but we could tell by the appearance of the water what was going on.

Q. Well, what was the appearance that would indicate what was going on?

A. The water was slack, and I would know from that it was settling there.

Q. So really the formation of the land you didn't see, but was something you inferred from certain conditions you saw?

A. Yes, sir; by the appearance of the water.

Q. You know that where a current is running strong on one shore and there is slack water on the other shore there is a considerable deposit going on where the slack water is?

A. Yes, sir.

Q. During the time that you ran on the river was there any sudden cutting off of land by the river at any point designated on this map?

173 A. Why, a cutting through or across that—why, there was.

Q. In 1877?

A. I think that is the year, but I am not positive; but whatever year it was—I would not like to say just the year.

Q. Was there any other cut-off?

A. Oh, yes.

Q. I mean any other time when the river cut through and left land intact upon opposite sides.

A. At other points?

Q. I mean in this locality.

A. Not to my recollection.

Q. And your recollection extends from 1856 to 1880?

A. Yes, sir.

Q. Now, describe how this cutting was done that you mentioned.

A. Why, it was the water wearing the bank and at some places undermining it. Some places the lower soil would go out before the upper soil would, and the upper soil would cave in in slices or chunks sometimes; at other times it would seemingly—although it was out of sight, it would seemingly undermine and a big piece would slide right down. It would just slide in in places, and the soil seemed to be taken out below. I judged that from the way it went in.

174 Q. What would become of the piece that would slide in?

A. It would wear away, too, seemingly before any more bank would go at that point; that had to wear away before the current could get at the bank again.

Q. What becomes of the material—the sand and earth that is worn away?

A. It goes off with the water and settles in those places as it happens to fall into where it is slack water.

Q. Below?

A. Below, of course. It can't cross the current. It goes wherever the current takes it.

Q. Where does the material, the sand and other sediment, come from—where did it come from—that settled—that settled and formed the land to the Nebraska shore?

A. It must have come from above—in the river at some point—in my judgment.

Q. Look upon the map marked Exhibit I and say whether or not the lines marked thereon showing the banks of the river in 1856, in 1868, in 1875, in 1876, and in 1877 are correct; and, if not, state wherein you would correct them.

A. As near as my recollection goes I have nothing at all to add to them. They look natural to me Of course, the exact
175 years are not altogether in my mind, but the different stages of the banks look about the same as they from my memory.

Q. During your service upon the river as a pilot in this vicinity did the river continuously change in the locality of Busha's bend, as indicated upon the map upon exhibit—that is to say, did it work down further south?

A. My impression is that it did, but there was some seasons that the change was very slight.

Q. And some when it was considerable?

A. Considerable; yes.

Q. Now, look upon the map marked Exhibit I and state whether the lines therein referred to in the vicinity of Saratoga bend show the changes which the river underwent in that locality.

A. Well, that is as near as my recollection goes of it.

Q. Of course you never made any surveys or measurements of the river except with the eye?

A. No; except with the eye.

Q. As a pilot you were regularly Government licensed?

A. Yes, sir.

Q. As a pilot you were required as a part of your business to observe the changes in the river from day to day?

A. Yes, sir; I had to.

176 Q. Did you do that?

A. I did; that was my study.

Q. And did you observe the changes in the banks of the river from day to day?

A. Yes, sir.

Q. Was that your study?

A. That was my study, too; that affected the next place we were going to. If I was going down this shore; I am studying how much of this was gone and to have some idea about where I would find this crossing.

Q. Do the banks figure in directing your boat?

A. Yes; the banks has a great deal to do with it, and more especially the draws of the current of the river, and we watch that, and wherever we see the water tipping out or too much going out we begin to think it is time to find a place to get out or we will get into a pocket.

Q. Well, after the cut-off, then what changes took place in the river?

A. It went right for the Nebraska bank right opposite the cut-off; it went right into the shore.

Q. State whether the current left the bend and shot down the cut-off.

A. It was only a short time until the current was not in the bend to speak of.

Q. What was this afterwards called?

177 A. As a lake.

Q. And the current didn't flow through that at all?

A. No, sir.

Q. That was still water?

A. After the thing got quieted down.

Q. Isn't it a fact that it has nearly flowed away?

A. Why, it has flowed away; especially it has flowed away at this bend. It has flowed off.

Q. You would say it has flowed off except the portion through the central part of it?

A. Yes, sir.

Q. Now, what changes have taken place in the river since what occurred there in 1877?

A. Well, I haven't been observing it since that time so much; not at this point. I have been away from it a good deal, but my recollection is — swung north, and since that time, when the Government was working trying to protect the point of the cut-off, that

the river had already receded from the north bank of the river. They was putting in rip-rap to protect that, and at that time I was at home and was unable to come down to the bank and look, but I thought the Government fellows had got a good place to pro-
178 tect, because the river would never wash it. It seemed to be receding south and has been since.

Q. In passing down from the cut-off, what was the course of the river below?

A. Right over across to the Nebraska shore and right close to the Nebraska shore, until you pass about the Union Pacific bridge.

Q. Do the lines marked "October, 1877," indicated about where the river ran at that time?

A. Well, as nearly as my recollection goes it does.

Q. Right down the shore?

A. Yes, sir; right down the shore.

Q. Then, before the cut-off, did the river flow where the blue lines show on the map referred to?

A. Yes, sir.

Q. And after the cut-off where did it flow?

A. It came into the Nebraska shore at this point and it kept right down the Nebraska shore instead of crossing back over to the Iowa shore, and it staid down by the shore until about the Union Pacific bridge, where it commenced to spread out again.

Q. You know where the channel of the river is now?

A. No, sir; it is down the Nebraska shore. I don't want but a glance to know that—that is, right here at Omaha—but be-
179 low the bridge I don't know; but it would puzzle a fellow to know where it is now.

Q. During high water, does the current of the Missouri river make any sudden and considerable changes?

A. In some places it does.

Q. What occasions such changes?

A. The soaking of the bank with water, you know, makes the bank soft and the heavy current that is in the river during high water strikes it and washes it out.

Q. But, during high water, is it not true that the bank remains intact and when the water begins to subside the banks begin to cut?

A. Why, they cut some in high water, but the heaviest cutting seems to be as the water recedes.

Q. Now, when the water recedes, has not the current about the same relative position as before high water—that as to being near the bank before high water and after?

A. Yes, sir.

Q. Although it may have moved?

A. Yes; the bank may have moved.

Q. That is, the high water does not of itself change the current of the river.

A. Oh, yes.

Q. I mean the mere overflow does not carry the current
180 out of its regular course unless there is some intervening cause?

A. No, sir.

Q. Well, the real occasion for the cutting of the bank is the current striking against it and eating underneath the surface?

A. Yes, sir; and the more direct a current comes across from one point to another the more it cuts.

Q. Then, after the current has struck against one bank it is entirely deflected over across the river?

A. More directly into the other bend.

Q. So that the course of the current is a kind of zigzag from bank to bank more than anything else?

A. Yes, sir; generally speaking. Of course there is instances where it divides and spreads both ways, and in that case it forms a middle bar or island.

Q. Now, then, instead of running up the river in the current you seek the edges?

A. Well, we seek the edges of the current, and that is done for to get our boat up quicker; but we want to be close to the channel, but we go out a little to the edge, so as to get our boat up a little faster. We have got to have the exact place. We have got to have the best of it, and the best of it is in the current.

Q. Yes; but if the water is high, then you seek the edge of
181 the current and the eddies—where the eddies are forming?

A. Not to get into them. You don't want to get into them very bad. The boat is not always manageable in eddies.

Cross-examination.

By Mr. McPherson:

Q. Where were you located on the river from 1856 to 1888?

A. Well, from 1856 to 1880 my home was at this point.

Q. Omaha?

A. Yes, sir.

Q. Where were you operating a boat?

A. Well, the first twelve years or about twelve years I was on ferries at Omaha.

Q. Between Omaha and Council Bluffs?

A. Between Omaha and Council Bluffs.

Q. That would take you to 1868?

A. Most of the time. There might have been times when I was off up the river for the company; but the principal business was right here.

Q. From 1868 on where were you?

A. From that time on I was a good deal of the time running up and down the river.

Q. Between what points?

A. Why, from St. Jo. to Sioux City and Fort Randall and occasionally to St. Louis, and then from St. Louis on up to as
182 high as Bismarck is the extreme points to which I have been.

Q. You was not at Omaha so much from that on?

A. I was passing here every season.

Q. Once or twice a season?

A. Oh, more than that; once a week or once or twice a month.
Q. What would be the trip once a week?
A. That was when I was running from St. Jo. to Omaha.
Q. And from St. Louis to the Upper Missouri it would be longer?
A. That would be longer, but that was after.
Q. What years were those?
A. Oh, they were different years; the last years.
Q. Where were you in 1877? Where were you running?
A. I think I was here with the transfer company.
Q. With the Omaha Transfer Company?
A. The Omaha Transfer Company.
Q. You spoke about just before the cut-off in 1877 took place there was only a breadth of thirty feet?
A. That is guessing with my eye—looking at it.
Q. How long did the river remain there with a breadth of thirty feet between the channels?
A. I don't know.
183 Q. How many days or hours?
A. I think the night before I noticed it, and I judged it to be about thirty feet, and the next morning, if my memory serves me right—about 9 o'clock—the cut-off was made—that is, the first breaking through.
Q. Two days before that what was the width through here?
A. Well, it would be guess-work; I could not give you the exact width.
Q. Approximate the width.
Q. Probably twenty feet wider or twenty-five.
Q. A week before that how much wider was it?
A. I don't know as I can tell you. I noticed it more particularly as it was narrowing.
Q. Take the month preceding, and, if you can, give the different widths till the time the collapse occurred.
A. I could not tell that because my attention was not drawn to it.
Q. Approximately?
A. It is my impression that at the first spring rise I should judge it would be seventy, eighty, or a hundred feet across there, and the spring rise had just gone down only a short time and it had been encroaching.
Q. A seventy-five foot strip would not hold the river there but a very few days, would it?
184 A. If the water hadn't got over the bank I think it would have held it quite awhile; perhaps until the next season.
Q. But it didn't hold it very long?
A. It didn't after the water got up; after the rise got up so it got over and flowed over the bank and reacted on the bank on the other side.
Q. What was the width of the bank there the year before this, in 1876?
A. It was pretty narrow.
Q. What was the width?

A. I could not tell you exactly.
Q. About what?
A. Well, probably it might have been one hundred and fifty feet or it might have been two hundred feet?
Q. Two years before. What was it in 1875?
A. It is merely guess-work on this width.
Q. What would you say it was in 1875 at that neck?
A. Two years before the cut-off?
Q. Yes, sir.
A. Oh, it was not so very wide.
Q. About what?
A. I know that two years before the cut-off that the Union Pacific thought it would take five years for it to cut through.
Q. About what was the width in 1876?
185 A. I did know at that time, but I don't recollect it now. I heard them say what it was.
Q. What would be your judgment?
A. It might have been three hundred feet and it might not. I could not pin myself down to any particular width without measuring.
Q. Could you say what it was in 1873, four years before?
A. Not so much so as I could closer to the time of the cut-off.
Q. What would be your judgment as to the width of that neck in 1873?
A. I would not know because I was not there to step or survey it. I could judge only from passing along down the river.
Q. What would be your judgment as to the width there in 1873?
A. My judgment would be something similar to the surveys there what they are.
Q. What are the surveys? What would you say would be the width there in 1873?
A. I would have to measure.
Q. You don't pretend to know anything about those surveys except you say they look natural to you?
A. Yes, sir.
Q. Now, I should think you would have it in your mind.
186 A. I have it in my mind generally about the course of the bank. This was timbered there and you could not always look *look* through there; to get at the width you would have to walk through there, or something of that kind.
Q. Then, when you say these surveys look natural to you, how are you able to say the surveys look natural?
A. They look natural to me as the river looked to me.
Q. Going back to the question, what would you say was the width of that neck, in your judgment, in 1873?
A. I don't know. There was a considerable strip of land across there, I guess, in 1873.
Q. What would be the width of the neck then?
A. I couldn't say.
Q. A quarter of a mile?
A. I certainly don't know.

Q. What would you say was the width there in 1873?

A. My recollection is not clear enough in 1873 to state the width of the strip.

Q. You will not approximately give the width there in 1873, will you?

A. I don't see how I could give anything that would be definite or anywhere near definite on that except the general run of the bank here around the water going around with the boat; that
187 I saw; but this across here I didn't see; unless I walked across it I would not see it.

Q. Then you don't know?

A. Really I don't.

Q. From 1873, then, down until, perhaps, the spring of 1877, you cannot give the width and where it was?

A. No; but as it got nearer I walked it over there.

Q. Consequently you cannot tell the encroachments that took place in each of those four years?

A. Not to actual measurements, no, and not to a certainty.

Q. I am not asking you for measurement because I take it you made none. As a matter of fact, you cannot tell what the encroachments were for each of these four years?

A. No; nothing more than I could see what had been going on and could see there had been encroachments.

Q. How much would go in at a time?

A. I couldn't tell.

Q. Approximately?

A. It was sometimes, not at one time.

Q. Isn't it correct that this falling in would occur when the water was going down after a rise?

A. Not altogether.

Q. Does it not invariably occur that after the river has
188 been up and when it is going down that that is when the falling would take place?

A. When the river comes up it cuts too.

Q. Did you ever see that—cavings in when the water was rising?

A. When the water was rising; yes, sir.

Q. When did you ever see it in the vicinity of Council Bluffs?

A. Right opposite Farnam street.

Q. What year did you ever see that when the water was rising?

A. Why, perhaps it might have occurred at that season of every year.

Q. In your judgment, did it occur every year when the river was rising?

A. No; I don't really think it did every year.

Q. Isn't it a fact that when this falling in commenced was when the water was going down?

A. No, sir.

Q. Don't the *the* water when it was rising in the river plow under and undermine the banks, and when the water would go down the caving in would commence?

A. It would do more than that; as a general thing, it done more than that to it. I have seen it in the first eight or ten inches of a rise cut the bank in extreme low water.

Q. Opposite Omaha?

189 A. I think I have, but I am not positive about it being in Omaha, but I have seen it at different places all along the river in certain points where the river cut that way.

Q. Where would the cutting in be—on the side of the river where the current was the heaviest?

A. Yes, sir.

Q. And when the river would go down, because of the slackness of the water on the other side the deposits of the water that was impregnated would make a bar over there?

A. Generally speaking.

Q. The river would always or usually retain its normal width before and after a freshet, would it not?

A. Why, the banks of it; yes, sir.

Q. If it was three hundred yards before the rise it would be three hundred yards after the rise?

A. It takes more room for extreme high water to come through than it does for low water.

Q. But — the river, say, would be three hundred yards in width before the rise, it would be about the same after it got back to about the same stage after a rise?

A. I think it would.

Q. And, generally speaking, if it cuts in on one side you

190 will find a bar on the other side?

A. Or a bar in the center or a low island.

Q. A low island?

A. Yes, sir; something that takes up that width; it may do it in the center or it may occur on both sides.

Q. What material changes were there in the river in the locality in question that occurred between 1856, when you first knew the river, and 1863 or 1862?

A. Why, there was quite a considerable change there.

By Mr. WOOLWORTH: Look at the map and point it out on the map.

A. There was quite a change in some portions of the bank.

Q. Name them, and what changes.

Q. Why, I think there was; if my recollection comes right, there was a change in this bend here, in section 22; it went south in Busha's bend.

Q. What change was made from 1856 to 1862?

A. Why, I don't think any more—that is, from my recollection I couldn't tell you exactly or anywhere near it, probably, but generally the bends in section 22 had worked south in the bank of the river.

Q. From 1856 to 1862 how far?

A. That is what I cannot tell exactly from my recollection. Of course I could measure on this map and give something that

191 way, but that is not my recollection. At the same time I

could see and judge, but as to locating them two years I cannot do it.

Q. Can you tell us the changes in the locality in question from 1862 to 1863?

A. No; no more than to say that these changes were more extreme, I should judge.

Q. The extreme changes commenced along about 1862 to 1863, did they?

A. I am not right positive, but it was in the sixties somewhere.

Q. They were more remarkable?

A. Yes; the banks seemed to wash more.

Q. That is, from 1862 or 1863, to your recollection, the changes commenced?

A. It was right on from 1862 and 1863 until the final cut-off was made.

Q. Not stopping at 1868?

A. No; not stopping; it continued on.

Q. Those changes have been going on at all times in the river?

A. During low water in the fall and summer here would stop the cuttings of the banks.

Q. The cutting would be from the two annual rises, would it?

A. Yes, sir; the spring and June rises was when the most of the cutting was done, although there would be times after going down, in extreme low water, when this Busha's bend would cut.

192 The upper end of the bend would cut in the early part of the rise, and as the water would recede it would extend to the lower end of the bend; the lower end of the bend would cut more.

Q. So, then, the most of these changes would occur twice a year?

A. Yes, sir.

Q. How much of a change would you notice at one time?

A. Seemingly to me there would twenty-five, fifty, or seventy-five feet of the bank go in.

Q. In what period of time?

A. Sometimes in one raise, and sometimes it would be in the two raises. I have noticed it more from certain objects that I would see on the bank. At times I would go up along the bank before a rise and then go up after the rise was going down and notice that my object was shoved out thirty feet and the river was running in along further south in that bend.

Q. During what period would that change take place?

A. That would be a week or two or three weeks.

Q. What portion of the south bank have you seen cut in at any one time?

A. Of this particular bank?

Q. Yes, sir.

A. I have seen a good deal of it cutting.

Q. How much in width?

193 A. I don't know as I would confine myself to stating that; it would go in pockets.

Q. Greater amounts, would it, at times?

A. Sometimes it seemed to be going in all along the bank, just continuously jumping in, slushing in.

Q. And sometimes it would — in in pockets?

A. Yes, sir; sometimes it would cut in at one place and take that, and then cut in more and take that.

Q. How long a time would intervene between those various washings?

A. Not very long when the bank was well soaked.

Q. Would you see them go in?

A. I would see the tops of it go in.

Q. Would there be timber on those parts that would go in?

A. Sometimes; there would be on some.

Q. Would it wash large trees in at the same time?

A. Not so much there until in the lower end of Busha's bend; there was some timber there.

Q. What sized trees would you see go in?

A. Different sizes.

Q. About what size was it?

A. I don't know.

Q. A foot in diameter?

A. Yes, sir; some of them eight inches and maybe more. There might be some more. The stumps were about a
194 foot. Of course the timber was cut off and young timber grew up again.

Q. You don't mean that growing trees a foot in diameter fell in, but stumps of trees that were cut off?

A. Yes, sir; growing trees, if there were any on the land, would fall in. I guess there was trees on there a foot in diameter; that is my impression.

Q. Didn't the company lease a lot of timber that they didn't own, and before they got it cut it washed in?

A. I think they must have some, some company. I don't know what company, but it seems to me that land belonged to a man named Smith at that time.

Q. How much of that live and growing timber washed in?

A. I couldn't tell.

Q. How many acres?

A. That I couldn't tell, for I don't know the number of acres there was in the patch or anything about it at that time.

Q. Did you ever have a place where you tied the boats to wash in?

A. Why, yes; right in that bend we did.

Q. When was that?

A. Well, now, it was in times during extreme high water, and we used to take the ferry, and used to run around this bend to where Busha's house was there; there was a high bank at one place,
195 and we could often, in times of high water, get the teams off of our boat, and this bend here would overflow, and we would go around up there with the boat—land. I think there was very little trees at that point.

Q. The timber was lower down?

A. We used to have to take the niggers out there to fasten our boat.

Q. How often would you have to change your places of landing?

A. Sometimes we would have to change before we unloaded our boat.

Q. Why?

A. Because the banks would fall in where we laid our line out, and we would have to make a change.

Q. Do — remember of a frame house or houses on the Iowa side washing in?

A. I didn't actually see the circumstance, but there was some standing there, and they disappeared, and the ground was gone.

Q. What year was that—do you remember?

A. No; I don't exactly; I couldn't place that year.

Redirect examination.

By Mr. GREENE:

Q. These extraordinary cuttings you speak of occurred during high water?

A. During high water; yes, sir.

Q. There was one or two years when they had extremely high water, wasn't there?

196 A. Yes, sir.

Q. When the whole bottoms were overflowed?

A. Yes, sir.

Q. Along in 1860?

—. Yes, sir; that is my recollection.

Q. And when that occurred the ground was thoroughly soaked?

A. Yes, sir.

Q. And this falling in which you described occurred during that season principally, didn't it?

A. In seasons where the water was high enough to soak the bank up it happened.

Q. Outside of the high water the water stood continuously, didn't it?

A. Yes, sir; more steady.

Q. Now, you was looking at the neck just before the cut-off or at the time of the cut-off through a field-glass, were you not?

A. Yes, sir.

Q. That occurred in 1877, I believe?

A. That is about my recollection; it is about the time.

Q. Your attention was called to the river by the Union Pacific authorities?

A. We generally, all of us on the boats, was expecting that to cut through, and it was only a question of time, and we were making different judgments as to the time when it would reach that.

Q. About what time, with reference to the cut-off, you went down there with some railroad people?

197 A. I didn't go down there. I was running on the ferry-

boat and they went over, Mr. Clark and Mr. Adams; and some of the contractors of the road were looking at it.

Q. And when they came back they were talking about how long it would be before it would get through?

A. Mr. Russell and Mr. Morse told me after they had gone off the boat that they allowed it would take five years; and I laughed at the idea, and I says, "I will be willing to wager money it will not be three years, and perhaps inside of two, in my judgment."

Q. And about when was it after that?

A. It was the second year.

Q. So in 1875 you were discussing then when it would break through?

A. That must have been in 1875.

Q. And before that the river kept going in that direction?

A. Yes, sir; it had become an appreciable neck then.

Q. There was a time when the neck of land was being cut from both sides, wasn't there?

A. Yes, sir.

Q. There was a double cutting there?

A. There was a double cutting.

Q. The two channels of the river were cutting towards each other quite rapidly?

198 A. The upper side was more rapid—that is, right at that bend—at Busha's bend; it was cutting this way faster than the opposite shore was cutting that way.

Q. What time is usually occupied by the rises of the river?

A. Oh, why, the extreme high water, where it overflows the banks, as a general thing, it must be a week until it gets within the banks again.

Q. Q. What seasons does that occur usually?

A. Well, there is the spring rises at the breaking up of the ice; it varies. Some years the river breaks here in February and some years it don't break until the last of March, and I have known it to hold on until April.

Q. Usually March would be a fair average of it?

A. Yes, sir; March would be a fair average of it, but the ice water or the spring rise don't generally come until in the latter part of April, because it gorges away up above. We may have the heaviest right after the breaking up here, but it comes from the gorges holding the water.

Q. I understand you that there are really two rises in the Missouri river?

A. Yes, sir; we term it that way; the spring rise and the June rise.

199 Q. The June rise is made from the melting of the snows in the mountains?

A. Yes, sir.

Q. And the early spring rise is formed at the breaking up of the winter?

A. Yes, sir.

Q. With regard to the wearing of the river, as the cutting is done

upon one shore, does there simultaneously appear upon the opposite shore and equal area of ground? Supposing, for instance, that thirty feet falls in upon one side, does there thirty feet at once appear on the opposite shore?

A. No, sir.

Q. While the ground may more or less rapidly disappear on one side in a minute or ten minutes the formation upon the other shore is constant and continuous, is it not?

A. Gradual. I don't know as it would be constant and continuous or not.

Q. Well, what forms land and sand bars, as I understand it, is — ceases to be agitated, and that then whatever is held in suspension is precipitated. Now, wherever you find still water in the Missouri river there must be more or less of a deposit there?

A. That is the sediment; as the water becomes still it settles.

Q. So that if the river is cutting upon one shore it must
200 necessarily be quiet and still upon the opposite shore, is it not?

A. No; it may be right in the middle of the river. It would be quiet there, too, maybe.

A. I suppose in this case there was only one current in Busha's bend?

A. Yes, sir.

Q. And also in Saratoga bend?

A. Not all the time. In the first part of the cutting of the Busha bend, it being a pretty straight piece of river, there was times when this shore was cut but little and a middle bar, but not very often.

Q. That was in 1856?

A. Yes, sir.

Q. But as the river began to cut——

A. As it got more of a bend to it the current set to the Iowa shore more.

(Excused.)

ALFRED D. JONES, being by me first duly sworn to tell the truth, the whole truth, and nothing but the truth concerning the matter in controversy herein, testified as follows:

Examined by Mr. GREENE:

Q. State your residence, age, and occupation.

201 A. I reside in Omaha, and I am nearly 78 years of age.

Q. How long have you resided in Omaha?

A. I have resided here since 1854.

Q. What was your business or profession in those days?

A. I was a surveyor when I first came here.

Q. State what, if anything, you had to do with the laying out of the original city of Omaha.

A. I laid out the original city.

Q. In what year?

A. In June and July, 1854.

Q. Were you here when the Nebraska shore of the Missouri river was meandered in 1856?

A. Yes, sir; I was, but I have no knowledge of the meandering.

Q. Have you been acquainted or somewhat familiar with the Missouri river in the vicinity of Omaha and Council Bluffs since you came here to live?

A. I have.

Q. Do you remember where the river ran in 1854?

A. Yes, sir.

Q. Do you remember where it ran in 1877, just before the cut-off occurred up around through Cut-Off lake?

A. Yes, sir; generally.

Q. Do you remember when the cut-off occurred?

202 A. Yes, sir; I was not in town at the time.

Q. Can you state generally — about what processes the changes in the location of the river was brought about from 1854 until 1877 and at the time of the cut-off?

A. I suppose it was by the washing of the bank.

Q. Whereabouts?

A. The only washing that I have any reference to of my own knowledge was just west of the Busha ferry. I ran a line from probably the quarter stake in section 21 in Iowa running due east, and the line extended and ran into Horseshoe lake, in section 23. I ran that line in the fall of 1852.

Q. Where, with reference to that line, was the river when you first ran it?

A. The river was just north of the line, between sections 21 and 22, the middle of the sections.

Q. Did you run it again?

A. I attempted to do it.

Q. When did you run it again?

A. Probably in the spring of 1853.

Q. Where did you find the river at that time?

A. I found the river cutting on my line; it cut my line.

Q. In what sections?

A. Well, probably in sections 21 and 22; that is to the

203 best of my recollection.

Q. Did you have any general information or knowledge about the changes of the river?

A. Only just in riding around.

Q. You have seen it from time to time?

A. Yes, sir; from time to time in riding; I never examined it particularly.

Q. Where was it cutting in Nebraska; what sections?

A. It cut around into the west half of section 22 and the north half of section 22 in Iowa, and into sections 1 and 2 in Nebraska.

Q. Look at Exhibit C and state if that in a general way shows the location of the river just before the cut-off or shortly before the cut-off.

A. That is about my idea I got from riding around in this part of the country.

ALFRED D. JONES.

204 HENRY HOMAN, of lawful age, being duly sworn on the part of plaintiff, testified as follows:

Examined in chief by Mr. GREENE:

Q. State your name, age, and residence.

A. Henry Homan; age, 43; residence, 2617 Davenport St., Omaha, Nebraska.

Q. How long have you lived in Omaha?

A. I came here in 1856.

Q. Have you been acquainted with the Missouri river in the vicinity of Council Bluffs and Omaha since that time?

A. I would say I have since that time. I have for the last 20 or 25 years—ever since I have been old enough to fish and hunt.

Q. Do you know where the river cut through in 1877?

A. Yes, sir.

Q. Do you know Cut-Off lake?

A. Yes, sir.

Q. What was Cut-Off lake prior to the cut-off—the time the river cut through?

A. It was the river.

Q. Do you know where the river ran about the time you first became acquainted with it?

A. Yes; I think I could locate it.

Q. Now, state how the river changed from where it ran when you first knew it to where it ran just before the cut-off.

A. I would have to use a map to explain.

Q. I will call your attention to Exhibit "C," to sections 21 and 22 in Iowa, and also to sections 1, 2, and 3 and 10 in Ne-
205 braska. Now, state how the river came down through sections 21 and 22 to where it ran before the cut-off in 1877.

A. It has been cutting in on this bank all the time, year by year, gradually making the bend much bigger.

Q. How was it over opposite—sections 1, 2, 3, and 10—where was it cutting there?

A. It was cutting on the north bank.

Q. What State?

A. I do not know what State.

Q. Nebraska, was it not?

A. Yes; I suppose it would be Nebraska.

Q. Now, what was going on while it was cutting on the Nebraska side near sections 1, 2, 3, and 10—what was occurring on the Iowa side opposite?

A. Whatever land was washed off on one side was built up on the other.

Q. Do you mean the identical land was built there or other land was being built?

A. I could not say whether it was the very land that was washed away. I should think not. I supposed it was a little further down the river.

Q. What was the fact about other land being added to Iowa constantly as this was being cut away from Nebraska?

A. It would naturally be added to Iowa; it follows the river on over and accumulates on one side while it was washing away on the other.

Q. Was that substantially going on up above here?

A. Yes, sir.

Q. How many years was it from the time you first knew it it was cutting in sections 21 and 22?

206 A. I could not say; it has been as far back as I first remember. There has been that cutting going on all the time; 25 years; as far back as I was old enough to know much about it. I fished and hunted when I was 15 or 16 up around those lakes.

Q. Approximately how long?

A. 25 years.

Q. During this time was it constantly cutting from the Iowa and building on the Nebraska, from 21 and 22?

A. It was from Florence; cutting away on that side all the time, and here it cut away on the Nebraska side.

Q. That process continued there for 25 years, to your recollection?

A. Yes, sir.

Q. Then what occurred in 1877?

A. I was away at the time of this cut-off in 1877; I was in the hills at that time.

Cross-examination of HENRY HOMAN.

By Mr. MCPHERSON:

Q. What is your occupation?

A. Liveryman and real estate.

Q. 43 years of age, now?

A. Yes, sir.

Q. Never have surveyed any?

A. I have been with surveying parties out West considerably.

Q. Chain-carrier?

207 A. No.

Q. What capacity?

A. Just a party. I have had several surveying parties out with teams.

Q. Teamster for surveying parties, were you?

A. I have furnished transportation for parties.

Q. You are not a surveyor by profession?

A. No.

Q. You do not know one section line from another?

A. Yes; up in the bottom there I know considerable.

Q. What section would lie north of 22?

A. I would not say that; I could not recall different sections. I own some land up there.

Q. You do not know what section lies west of 22 nor south nor east, do you?

A. No; I could not tell you how they run up there.

Q. When did you first know the river in the vicinity of sec. 21 and 22, as indicated by map "C"?

A. I judge 25 years ago; but I want it understood I could not locate the sections.

Q. Since about 1866 you have known the river in that vicinity?

A. Yes, sir.

Q. Shortly after the close of the war?

A. Yes, sir.

Q. Do you know what part of section 22 was occupied by the river, if any?

A. No, sir.

Q. Section 21?

A. No, sir.

208 Q. Section 20?

A. No, sir.

Q. Can you tell any year from that time until the present what sections on the Iowa side was occupied by the channel of the river?

A. No, sir.

Q. Can you tell within half a mile of it?

A. Not without referring to the map. What sections?

Q. Sections 20, 21, and 22.

A. I should think the river would have been way off in here.

Q. What year?

A. Take it back 18 to 20 years.

Q. Take it back 20 years would be 1871?

A. Yes; the river has always been washing and working.

Q. I want you to indicate on map "Exhibit C" there. Take "Exhibit C" and show, for the benefit of the court, where the river channel was in any particular years.

A. Well, taking it back 20 years, I could not tell how fast this cut has come.

Q. Where was it in 1872?

A. I can give you the distance.

Q. When did you last see the river where it made that move to the north, prior to the cut-off?

A. Was the cut-off in 1877?

Q. Yes, sir.

A. It was in 1875 or 1876.

Q. You do not know how wide it was at the neck of the loop there?

A. I should think it was a quarter of a mile across there.

209 Q. You made no measurements?

A. No, sir.

Q. You do not know whose land lies there in the neck of the loop, then?

A. I believe I knew some of the parties. I cut wood off their land years ago.

Q. What is the biggest cut-off of 21 and 22, south of the Iowa *sic*, you know was made in any one year—how much of the banks fell in in any one year?

A. I could not say.

Q. About what would you approximate it at?

A. Some years it worked in a good way, two or three hundred yards, three or four hundred yards; that is just the way it cut the front of Omaha away—that was, washing out considerable every year.

Q. You would say three or four hundred yards some years?

A. From this lake to this river. This is the old Council Bluffs lake, where we used to hunt and fish a good deal. It was all of a mile to a mile and a half from that lake to this river 20 years ago; now I do not suppose it is 600 feet.

Q. The river used to run through 22?

A. Yes, sir.

Q. How far would that recede to the south in one year?

A. I could not say.

Q. Three or four hundred yards?

A. Yes. Sometimes a great deal more; probably cut that
210 in one high water. As the river was going down these banks cut away very fast.

Q. How much in any one day would the river recede?

A. Sometimes in chunks—20 or 30 feet in a day.

Q. Two or three days or three or four weeks afterwards another chunk would break off?

A. No; sometimes in an hour another chunk would fall off; when the river was falling was when it did its big cutting.

HENRY A. HOMAN.

EUGENE L. WARE, being first duly sworn by the commissioner, testified as follows:

Examined by Mr. WOOLWORTH:

Q. Give your full name.

A. Eugene L. Ware.

Q. What is your profession?

A. Engineer.

Q. Civil engineer?

A. Yes, sir.

Q. In what company are you employed?

A. I am employed in the U. P. R'y Company.

Q. In what office?

A. In the office of chief engineer.

Q. How long have you been in that office?

A. Since 1881.

Q. Look upon the paper entitled map of Missouri river at Omaha, showing water lines of 1867, 1868, 1875, and 1876, and state what it is.

A. It is a map that has been in the office of the chief
211 engineer of said company ever since I have been connected with the office.

Q. State whether it is the official map used by the company in the conduct of its business, and particularly its engineering department.

A. Yes, sir; it is a map which the companies use when they have had occasion to refer to the record at different times in making its tracks and other things.

Q. State what is the custom of the company in taking surveys of the river and marking them upon this map.

A. Our usual way in obtaining notes for a map of this sort is to run meander lines as near to the river as they can get them; then measure distances from these lines to the river; then in the office these lines are platted in the manner usually adopted by engineers.

Q. Since you have been in the service of the company have the lines been transferred to and do they appear upon this map?

A. Not that I know of. This map in not later than 1877.

Q. No lines have been put on since you have been there?

A. No, sir.

Q. Have you notes of the surveys showing the banks of the river at different periods?

A. We have in our office the field-notes of various surveys of the river at different dates.

Q. Did you ever trace them out on this map?

A. No, sir; we have had no occasion.

Q. Have you recently made a copy of this map, somewhat reduced?

212 A. Yes, sir; I have recently made a reduced copy of this map.

Q. Now, did the several river lines appearing upon the original or do the several lines showing the banks of the river in different years accurately appear upon the copy you made?

A. Yes, sir.

Q. State whether or not that is the copy (showing witness map).

A. Yes; that is a copy.

Q. Then I understand you that this copy is an exact reproduction of the river in different years, as appears upon it, and of the banks of the river, as shows on the original map?

A. Yes, sir; the river lines shown on the small reduced copy are identical with the river lines shown on the original map.

Q. Is it permissible by your company for the map to go out of the custody of the engineer in charge?

A. I *no* of no way to determine that question.

It is agreed between the parties that the copy testified to by the witness shall be treated as the original.

EUGENE L. WARE.

C. F. POTTER, being first duly sworn by the commissioner, testified as follows:

Direct examination by Mr. GREENE:

My name is C. F. Potter. I reside in Omaha, and am civil engineer of the U. S. Missouri River Commission.

213 Q. State your age, Mr. Potter.

A. 34 years.

Q. What is your profession?
A. Civil engineer.
Q. How long have you been in the practice of your profession?
A. A little over thirteen years.
Q. Are you familiar with the Missouri river?
A. Yes, sir.
Q. How long have you been engaged upon it?
A. Nine years out of the last thirteen.
Q. In what service have you been engaged during that time?
A. With the commission since it was organized, and before that with Colonel Sutor, who had charge of the Missouri river.
Q. Where are you now stationed?
A. At Omaha.
Q. What are your duties with respect to your Mo. river commission?
A. Clearing out the obstructions in regard to river improvements and surveys on what is called the Omaha division, from Sioux City to Plattsmouth.
Q. Then you have charge of the division from Sioux City to Plattsmouth at present?
A. Yes, sir.
Q. How long have you had charge?
A. About three years.
Q. Are you familiar with the habits of the Missouri river and its character from study and personal observation?
A. Yes, sir.
214 Q. What is the fact with respect to the river maintaining its width at any particular point?
A. It may vary.
Q. Its width may vary?
A. Yes, sir.
Q. Does it vary at different seasons of the year?
A. Yes, sir; owing to the difference in the volume of water.
Q. And what about its varying at different years in width at any particular place?
A. It may vary in different years.
Q. What is the fact with respect to maintaining its width at any point where it may be cutting into one shore?
A. It is usually the case where rivers cut into the bank to be a formation on the opposite side, but not always.
Q. Not always?
A. No.
Q. Is there any point in this vicinity where the river cuts into any point on one shore and not filled on the opposite shore?
A. I think there is a place below the U. P. bridge on a map taken several years ago where there has been a cut and no fill on the corresponding side.
Q. How much of a cut is there at this point below the bridge you refer to?
A. I could not say without looking at the map.

Q. Suppose you look at the map and state approximately. I do not care about its being exact.

215 A. Take that portion (indicating on map). There would be a cut of one thousand feet between those two surveys that does not indicate any deposit on the other side.

Q. And for how much of the distance up and down the river?

A. Three-fourths of a mile.

Q. And may this be repeated at other places up and down the river?

A. Yes.

Q. It is your observation and experience that it does?

A. Yes, sir.

Q. Do you know any place where it may fill on both sides at the same time?

A. No, sir.

Q. What becomes of the volume of water where the river narrows at any place?

A. I don't know whether I could answer that question.

Q. How is it disposed of?

A. It usually runs with increased velocity and scours deeper.

Q. Describe the process of cutting on the Missouri river.

A. There are several ways in which a bank will cut. One is where the channel is running close to the bank the natural erosion and contact with the bank will gradually wear it away, and again there may be obstructions in the river so as to throw the current directly toward the bank. It may be a peculiar formation of

216 a sand bar or something to throw the river directly against the bank. Again, there may be a hard point in the bank, natural or artificial, and where the water will come around and form an eddy and the bank naturally be cut by contact with the eddy.

Q. Describe this undermining process which is referred to in the testimony.

A. Further up the river the channel is either running along the bank, or whether it is running into the bank it is liable to wash out the quicksand from the harder substance above and undermine it to a certain extent.

Q. And what becomes of the surface after it is undermined?

A. It will drop into the river.

Q. Have you observed at any time in this locality or during your experience how large an area may fall in at any one time or be undermined?

A. They will vary; it depends on the nature of the soil how much it will stand of its own weight, how much will fall in; if there are no roots the undermining distance will not be very great.

Q. Well, what is a fair statement of the average?

A. From five to fifteen feet.

Q. What becomes of the ground that falls in?

A. Part of it is taken away in the water in suspension; other portions are moved along the bottom of the river, roll along in very small particles.

Q. Describe the process of the formation of land where it is formed in the Missouri river and adjacent to the shore.

217 A. This material carried in suspension will, where the water goes outside the channel—where the current becomes less the velocity is less, and the material held in suspension will be deposited.

Q. What effect, if any, does sand driving and blowing have in building up land after it is once deposited above the water line?

A. It is often the case you find sand blowing from sand bars.

Q. State if the process of forming land to the shore is a gradual and imperceptible one.

A. It is gradual and imperceptible.

Q. What you call in law accretion?

A. Yes, sir.

Q. Is there any relation between the amount of ground that may at any one time be washed away on one side and what may appear upon the other—that is, is the cutting away upon the one side and the formation on the other contemporaneous and simultaneous?

A. It is usual where there is a cutting away on one side there is a corresponding increase on the other, but not always.

Q. But where cutting on one side, you may say, a piece of 15 or 20 feet may fall in and be carried away upon the water, not does there at the same time be formed an equal amount on the other side?

A. Not necessarily.

Q. The land is always formed by deposits or other slow and imperceptible causes?

A. Yes, sir.

218 Q. I will ask you to look at this map, marked map of the Missouri river in the vicinity of Omaha, Nebraska, surveys of 1879 and 1890, and state what it is.

A. It looks to be a copy of the official map of two surveys—official map of the Missouri—one made in 1879 and the other in 1891.

Q. Who made those surveys—under whose supervision?

A. P. W. Wellman, assistant engineer, made one in 1879, and the one of 1891 was made in my office.

Q. Have you this same map in your office?

A. Yes, sir.

Q. Have you a copy of this in your office now?

A. It is not a copy, because it is not the same scale, but it looks to be the same map.

Q. What do you mean by a copy? Is it on an enlarged scale?

A. One is larger and one is smaller.

Q. But the lines are located the same?

A. That is not for me to say. I did not make it.

Q. It looks to be the same. Mr. Potter, I will ask you about the banks which are found along the river parallel to the water banks, so called. What formed those banks, to start with?

A. There is the original bank of the river.

Q. Then when a sand bar or accretion forms there is a bottom or lower level of land, too. Now, how is that built up to a level of the second bank—by what process?

A. It is very seldom built up to a level of the second bank.

Q. Well, approaching it.

219 A. It might be built up in the same way that ordinary accretions are made, as I have stated before, or it might be the river has gone on the entire side of the sand bar or by deposits in the water; also sand blowing.

Q. Is not the blowing of sand an important feature in the building up of these bottoms?

A. It is.

Mr. WOOLWORTH:

Q. From the water bank back for a greater or less distance you then find another high bank of ground, don't you?

A. Yes, sir.

Q. And you think that was at some time or other the water bank of the river, do you?

A. It might be the bank of the river almost any year.

Q. How do you account for it that the land back of the second bank is so much higher than the surface of the river or the surface of the ground between that bank and river? Have you any theory about it?

A. No, sir; I don't know that I have.

Q. How possibly might it be accounted for?

A. It might possibly be accounted for from the fact that the river had not been in that second bank for a good many years, and this higher bank might be raised much higher than anything else by wind shifting the sands.

Cross-examination.

Mr. MCPHERSON:

220 Q. You say that the river never cuts, or you say that it does cut upon both sides or not—that is, simultaneously?

A. No, sir.

Q. It does fill, you think, sometimes on opposite sides?

A. I have never seen a case of that kind.

Q. You have never seen it cut and fill on opposite sides at the same time?

A. No, sir.

Q. You have seen it cut from the one side and not fill from the other?

A. Yes, sir.

Q. That is more theoretical than it is practical, is not it?

A. Well, it is the exception rather than the rule.

Q. Why does it cut upon the one side usually and fill upon the other? This is a subject of demonstration from the law of physics, isn't it?

A. The water needs a certain width in a river, and if the river cuts on one side in will naturally fill upon the other side.

Q. Does it fill upon the other side or simply fall away?

A. It will fill.

Q. Before it cuts on one side there must be an abnormal flow on one side?

A. There will be no practical cut.

Q. There must be a greater per cent. than the average, both in volume and in current?

A. Yes, sir.

221 Q. Now, if you get more than the average you get a cut on the one side?

A. Yes, sir.

Q. You may name a single instance up and down the Missouri river in which there has been a cut on the one side and there has not been a fill or an island on the other side.

A. There are often cases where the river is wider than others.

Q. You may state one instance where there has been a cut on one side and not a fill on the other.

A. That would have to be determined by soundings.

Q. Did you say on direct examination that there was a cut just below the bridge?

A. Yes, sir.

Q. Is there not a dilation there?

A. It looks so on the map.

Q. Every time you cross the river don't you see it? Will you stake your reputation by saying there is a cut on one side and not a fill on the other?

A. I think that can be done; yes, sir.

Q. You will not say that this is so, will you?

A. Yes, sir.

Q. How do you account for it? What law of physics will teach you that?

A. It can be done in this way: The section of the river varies greatly. Sometimes there is a deeper portion near the bank—in fact, nearly always—but the bank will vary from—except in this one place, where the channel is deepest, to the other side. I can make a drawing to indicate what I mean—that the river can

222 cut. You might have a section like that (indicating), where the bulk of the water was in this channel—where the river is there; but the section might also be like that (indicating), with this water line, and it still be cutting there.

Q. Would not there be deposits there?

A. There would be deposits.

Q. As soon as the water subsides would not there be a bar there?

A. There might or might not.

Q. Give us an instance where there has not been.

A. I could not do it.

Q. You never have seen such; you do not recall seeing such?

A. No, sir.

Q. Have you examined the maps in controversy?

A. No, sir.

Q. You have not examined them with reference to the subject-matter in this case?

A. No, sir.

Q. So you cannot say whether or not these supposed cases you give have ever occurred at any point in the river that is covered by this case?

A. No, sir.

Redirect examination:

Mr. GREENE:

Q. What is the fact about the Missouri river falling opposite the smelting works near Omaha and cutting on the opposite side?

A. There has been very little change there according to high and low water. There has been very little change in the river since I have been there.

Q. You mean there is very little cut in Nebraska?

223 A. On the opposite side it will vary with high and low water. There has been very little change in that bar since I have been here.

Q. The Government maps or the maps which are in charge of the Missouri river commission show precisely the condition of things which you have described with reference to cutting upon one side without filling on the opposite side?

A. It shows the condition in eleven years.

Q. In that eleven years I understand you to say it cut 1,000 feet without any perceptible filling upon the opposite shore?

A. Yes, sir.

Q. Whether there is any theory for it or not that is a fact, as far as the maps appear and as surveyed?

A. Yes, sir.

Recross-examination:

Q. How long have you been stationed at Omaha in your professional capacity?

A. Nearly three years.

Q. And this point at the smelting works that you speak of is protected by works, riprapping and other artificial works, on the Nebraska side?

A. Yes, sir; the smelting works have been a protection.

CHAS. F. POTTER.

224 "EXHIBIT E."

No. of tree.	Location of tree.	Circumference.
No. 1	Lot 45, W. side of 30th St.	4′ 7″
No. 2	Lot 45, E. side of 30th St.	6′
No. 3	Lot 45, N. of meander line 20′	5′ 3″
No. 4	Lot 45	6′ 4″
No. 5	Lot 45	6′ 4″
No. 6	Lot 45	7′
No. 7	Lot 46, so. meander line	3′ 2″
No. 8	Lot 46	4′ 7″
No. 9	Lot 46	5′ 6″
No. 10	Lot 46	2′
No. 11	Lot 46	4′ 3″
No. 12	Lot 46	3′ 3″
No. 13	Lot 46	3′ 3″
No. 14	Lot 46	2′
No. 15	Lot 46	2′ 6″
No. 16	Lot 46	2′
No. 17	Lot 46	2′
No. 18	Lot 46	2′ 7″
No. 19	Lot 46	1′ 4″
No. 20	Lot 46	3′ 5″
No. 21	Lot 46	3′ 7″
No. 22	Lot 46	3′ 4″
No. 23	Lot 46, 100 ft. N. W. of # 22	5′ 4″
No. 24	Lot 45, 150 ft. S. W. of # 23	6′ 7″
No. 25	Lot —, 150 ft.	
No. 26	Lot 45	6′ 4″
No. 27	Lot 45	3′ 5″
No. 28	Lot 45	7′ 4″
No. 29	Lot 45	5′ 5″
225		
No. 30	Lot 45	5′ 4″
No. 31	Lot 45	5′ 8″
No. 32	Lot 8, N. W. cor. 29th and Locust Ave.	3′ 4″
No. 33	Lot 8, 150 north of # 32	4′
No. 34	Lot 8, 100 no. east of # 33	5′
No. 35	Lot 45	5′ 2″
No. 36	Lot 45, 100 ft. N. E. of # 35	6′
No. 37	Lot 45	6′
No. 38	Lot 45	5′ 6″
No. 39	Lot 44	2′ 5″
No. 40	Lot 44	3′ 6″
No. 41	Lot 44	5′
No. 42	Lot 44, centre bl'k 8, lot 44	7′ 7″

"*Exhibit E*"—Continued.

No. of tree.	Location of tree.	Circumference.
No. 43	Lot 44, 100 ft. N. of # 42	7′ 1″
No. 44	Lot 44, lot 22, bl'k 7	6′
No. 45	Lot 44, lot 22, bl'k 7	5′ 5″
No. 46	Lot 44, lot 42, bl'k 7	5′ 4″
No. 47	Lot 7, no. side park opp. 27th St., 150 so. # 46	5′ 5″
No. 48	Lot 7, 50′ S. W. of # 47	4′ 8″
No. 49	Lot 7, 60′ S. E. # 48	3′ 8″
No. 50	Lot 7, 50′ S. W. of # 49	2′ 5″
No. 51	Lot 7, S. W. # 50	2′ 4″
No. 52	Lot 7, so. of Locust avenue	3′
No. 53	Lot 7, S. W. 100 of # 52	2′ 8″
No. 54	Lot 7	2′ 8″
No. 55	Lot 7	2′ 6″
No. 56	Lot 7	2′ 2″
No. 57	Lot 6	2′ 1″
No. 58	Lot 6	2′ 2″
	Trees on 3 blocks, # 1, 2, 3.	
226	Lot 15, east of box factory, run from 9″ to 1′ 2″ circumference. On block 6, sublot 6, trees run from 1′ to 1′ 9″ circumference. Lot 16, west of 21st St., so. of Ave. J, the largest tree 2′ 5″ and run down to 10″ in circumference.	
No. 59	Lot 16, lot 16	2′ 5″
No. 60	Lot 16	10″
	Trees on lot 17 all small; trees from 9″ to 12″ cir. Lots 18 and 19 have no trees of any size. Lots 25 and 24 have small trees, saplings, brush.	

THEODORE MILLER, being first duly sworn by the commissioner, testified as follows:

Direct examination by Mr. GREENE:

Q. State your name, age, and residence.
A. Theodore Miller; residence, Omaha; age, 30 years.
Q. What is your business?
A. I am employed in the Eas- Omaha Land Co.
Q. How long have you been in their employ?
A. Nearly eighteen months.

Q. Look at this map which I show you, marked Exhibit D,
227 and state what these marks in sections 21 and 22 as originally surveyed in Iowa indicate.

A. This map is a tracer from the map upon which I indicated these marks. It is a tracing of the map that our company had printed, showing this section of territory—East Omaha—and showing these sections where the river ran in 1870, and of which this is an exact tracing in size and scale. These dots here (indicating), with the corresponding numbers, indicate trees, as they are located upon the ground now. I went up there myself and located these trees. These dots would not indicate exact measurements in feet and inches, but they are within these on which they are indicated here.

Q. Now, where are the largest trees?

A. The largest trees I found were in what is called, according to this plat, lots 44 and 45. The diameter of the trees was about one foot.

Q. What is this statement here, marked Exhibit E?

A. That is a copy of the measurements which I made.

Mr. WOOLWORTH:

Q. Is that an actual statement of the size of the trees which you measured?

A. I didn't myself measure the trees; Mr. Haines, the foreman, who was with me, measured the trees. I gave him a tape line and he called them off to me and I took them down.

Q. And that is a true copy of your notes as you took them down?

A. It is correct, so far as I could tell.

228 Cross-examination.

By Mr. MCPHERSON:

Q. What kind of trees are they?

A. I think they are commonly termed cotton-wood.

Q. What is the usual average age of the cotton-wood from a foot to eighteen inches in diameter?

A. I could not tell.

Q. Have no idea?

A. No, sir; I have no idea of the age of a tree of that size.

Q. What height from the ground were those measurements made?

A. About one foot from the ground.

Q. The further away from the river the larger the trees are. In lots 44, 45, and 46 the largest trees are?

A. In lots 44 and 45.

THEODORE MILLER.

TUESDAY, *Sept.* 29, '91.

Cross-examination of THOS. TOSTEVIN.

By Hon. JNO. Y. STONE:

Q. Mr. Tostevin, by what name is that area of land between Council Bluffs and Omaha which lies between the meander line of 51 and the present bed of the river?

A. Practically known as Cut-Off island.

Q. Have you in your possession a map of Cut-Off island?

229 A. Yes, sir.

Q. Will you produce it and attach it to your deposition as an exhibit?

A. Yes, sir.

(Witness here produced a map marked as Ex. D.)

Q. What do the figures on the map indicate at the points where the lines intersect one another?

A. The figures indicate the sections, townships, and ranges both in Nebraska and Iowa as originally surveyed by the United States.

Q. What do the figures at the points where the lines intersect indicate?

A. They indicate the division of the land into 40-acre tracts and the numbers of the sections.

Q. What does the yellow coloring indicate?

A. It indicates the land that had been occupied by the Mo. river between the years '51 and '91.

Q. Describe the changes that it had made during the period of six to ten years prior to '77.

A. That would be indicated by the difference of the meander line of '68 and this meander line of '77, the corresponding banks. This is the left bank of the Mo. river. The line marked left bank is U. P. survey, '68, and indicates the left bank of the Mo. river.

Q. What do the expression- or words along the lines of this map indicate?

A. They indicate what they state on the map.

Q. I observe on this map a tract of ground in the midst of this area marked green; what is that tract of ground and why is it colored?

230 A. It is an uneroded area included within the boundaries of the State of Iowa and bounded on the north and west by the meander line of '51.

Q. What is the truth as to this portion of ground ever having been eroded since the meander line of '51 was run?

A. It has not been disturbed by the Mo. river or eroded since the year '51.

Q. What does the red strip of ground indicate on the map on the N. E. corner of it?

A. It is an old channel of the river and is now a park deeded to and belonging to the city of Council Bluffs by act of Congress. It was meandered and excluded by the Government surveys as a lake. It is now being improved by the city of Council Bluffs as a park.

Q. How long have you been familiar with the Missouri river at this point in controversy?

A. Since April, 1854.

Q. Will you describe the river or nature of the river or formation of the river bottom and bed between the two bluffs.

A. It is all alluvial, giving the evidence of having been carried and deposited. It is not possible to tell how many times it may have been moved. It is probable that in the past it has been moved many times.

Q. What is the nature of the soil forming the earth?

A. It is partly sand, partly clay, and partly vegetable matter.

231 Q. What is its nature as to susceptibility to the action of water?

A. It is easily separated by the action of the water except where beds of clay have been formed, ordinarily called gumbo, which have the power of adhesion and resistance of the action of the water better than the neighboring soil.

Q. Describe in detail the operation by which the soil drops into the river.

A. If the current impinges upon the friable banks it has a tendency to undermine at the level of the water and deprive the superincumbent mass of its foundation—that is to say, the water washes the foundation away, and as the foundation washes it falls in.

Q. How much will wash away in 24 or 48 hours?

A. I am not able to say just the amount, having not measured the exact amount.

Q. How much have you known in the course of a season to fall in?

A. I could not say by actual measurement.

Q. Give an estimate.

A. During the time of the greater part of the erosion I was not present, and I——

Q. How much of the cutting of land was from, say, the six or eight years prior to '77?

A. Between '68 and '77, a period of nine years, there was three-quarters of a mile nearly in width on the eroded area. It is very nearly three-fourths of a mile between the left bank of the survey of '68 and left bank of '77 of 3,900 feet.

232 Q. Now, while the erosion was going on on one side what was happening on the other side?

A. There was an alluvial deposit corresponding to the erosion.

Q. Corresponding in what?

A. In area.

Q. What is the truth as to the preservation of the width of the river during the changes at all times?

A. The river retains its uniform width year after year, carrying about the same comparative width after the floods.

Q. These smaller squares on the map, you say, are 40-acre tracts, do you?

A. Yes, sir.

Q. They have been resurveyed?

—. ——.

THOS. TOSTEVIN.

(Mr. GREENE: We desire to examine Mr. Tostevin on some minor subjects. Do you object?

A. Why, no.)

Defendant's Testimony.

Mr. TOSTEVIN is now put on as a witness-in-chief by the defendant and examined by Mr. STONE:

Q. Mr. Tostevin, have you any maps that indicate the changes in the Missouri river in the township or in areas just north
233 and just south of this—changes that you have been testifying about?

A. Yes, sir.

Q. Will you produce them?

A. These are the maps.

Witness here attaches to his deposition a map marked Exhibit B 2.

Objected to be Mr. Greene for the reason that it is irrelevant, immaterial, and incompetent.

Q. Mr. Tostevin, you may describe what this map indicates.

A. The parts in yellow indicate the ground occupied by the Missouri river between the years 1851 and 1891.

Q. What direction is the ground indicated by this map from Cut-Off island?

A. It is in the township adjoining on the south.

Q. How far are these changes as exhibited on this map from the changes indicated on Cut-Off island?

A. About five miles—hardly so far as that; from centre to centre, I suppose, five miles.

Q. What do these figures on the map indicate?

A. They indicate the number of the sections.

Q. And the smaller sections—the forty-acre subdivisions?

A. The forty-acre subdivisions.

Q. Have you a map similar in character to the country just north of Cut-Off island?

A. Yes, sir.

Q. Will you produce that?

234 Witness here produces a map and attaches it to his deposition, marked B 3.

Objected to by the plaintiff as immaterial, incompetent, and irrelevant.

Q. Mr. Tostevin, you may describe briefly what *what* this map indicates.

A. The parts colored yellow include the ground covered and occupied by the Missouri river between the years 1851 and 1891.

Q. And the words or expressions on the map in figures indicate what they say?

A. Yes, sir.

Q. The figures refer to the sections, do they?

A. Yes, sir.

Q. And the smaller sections the forty-acre subdivisions?

A. Yes, sir.

Q. How far is this ground, say at the point indicated as section 8, from Cut-Off island?

A. It is about 5 miles north from centre to centre, I think.

Q. From the centre of Cut-Off island to the centre of the river?

A. Yes; five or six miles.

Q. Mr. Tostevin, what is the general difference, if any, in the soil and material of the river bottom at these two points above and below Cut-Off island?

A. I think there is no difference in the nature of the soil.

Q. I will ask you now, Mr. Tostevin, if you have made a map of this Cut-Off island country in which you have traced a line
235 intermediate, or nearly so, between the meander line of 1851 and the meander line of 1856.

A. Yes, sir.

Q. Will you produce it and attach it to your deposition as Exhibit C?

Objected to as immaterial, irrelevant, and incompetent, and for the further reason that the map, Exhibit A, already in evidence shows precisely what appears on the map now offered.

Witness here produces map, which is attached to his deposition and marked Exhibit C.

Q. Mr. Tostevin, you may point out, if you please, what this map indicates.

A. It was designed to indicate this portion of the original corporate limits of the city of Council Bluffs and its present corporate limits, and also with the additions of one-half the unsurveyed line indicating the unsurveyed interval on the north between the meander line of 1851 and the meander line of 1856. The purpose of this was to get a line which would equally divide that unsurveyed interval.

Q. What do the words and figures on this map indicate?

A. What they state, as nearly as I am able to say.

Q. I will ask you now, Mr. Tostevin, if you are familiar with the description of the lines as set out in the answer and cross-bill in this case.

A. Yes, sir.

236 Q. What have you to say as to this broken line between the meander lines of 1851 and 1856 being an accurate marking of the description contained in the answer and cross-bill?

A. It is an accurate marking of that description.

By Mr. McPherson:

Q. Mr. Tostevin, the map that you now produce, marked Exhibit A, represents what?

A. It was designed to show the relative position of the two cities as their boundaries would be defined by the petition in this case, the original petition in this case, for the purpose of giving a better general view and understanding of the situation by showing the proposed boundaries of the two incorporated towns in different colors.

Q. What does the blue and the green each respectively represent?

A. The green would indicate the Territory of Iowa, and the blue that of Nebraska.

Q. As covered by the petition of the State of Nebraska?

A. Yes, sir.

Q. As of what date?

A. About January, 1877.

Q. How long preceding the final break or cut-off of the river?

A. About four or five months.

Q. Will you attach this to your deposition and mark it Exhibit A?

Objected to as incompetent, irrelevant, and immaterial.

A. Yes, sir.

Witness here attaches map to his deposition.

237 Q. The wordings and statements thereon indicate what they purport to, do they?

A. Yes, sir.

Cross-examination:

By Mr. Greene:

Q. Calling your attention to Exhibit C, the broken line marked thereon is not a line that has ever been established by any survey?

A. No; except by mine.

Q. It is only a line which you have yourself drawn as indicating where, under your theory of the law, the boundary line between the two States should be established?

A. Yes, sir.

Q. I will call your attention to the point "B" on this map, where the meander line of 1856 appears to touch the meander line of 1851. Is that correct?

A. That is the way I made it.

Q. Yes; but is it not true that according to the Government survey the meander line of 1856 intersects the meander line of 1851?

A. It does not plat that way.

Q. Is it not generally platted that way?

A. I think it is about equal; some say it crosses and some make it about forty feet; I made it forty feet.

Q. Did you ever run the line?

A. I platted it in from the Government notes.
Q. From the Government notes?
A. Yes, sir.
Q. You platted this from the Government notes?
A. Yes, sir.
Q. Where did you obtain them?
A. From Mr. Stone.
238 Q. Do you know whether they were correct or not?
A. Yes; I have every reason to believe they were.
Q. You have reason to believe; they were handed you from Mr. Stone?
A. Yes, sir.
Q. Do you know where he got them?
A. He told me he got them from Washington.
Q. Do you know if they were correct?
A. I think he knew they were right.
Q. I don't ask you what you think; I ask you what you know. Everything that is upon this map, excepting this visionary line of yours, appears upon Exhibit B, does it not?
A. I have endeavored here to define in color——
Q. Except the color?
A. Except the color, I believe, is indicated on that map. I also ran another line which is not there. In accordance with the theory in your petition I endeavored to give a close definition and describe that line by metes and bounds, as set forth in your petition.
Q. The lines that appear upon this map, so far as they purport to be established by any surveys, appear upon the first map, do they not?
A. Yes, sir.
Q. What light will this rich coloring throw upon the case?
A. It will enable the judge to tell at a glance without the tedious operation of examining dates.
Q. Do you not suppose that the judges could see it if it were left in white and black, as on the first map?
239 A. It would be a tedious operation and this elucidates the matter and is a common method of making maps.
Q. Do you think the judge, then, looking at the first map as it is already platted and surveyed, would not accept the matter so strongly as if presented in this rich coloring?
A. No, sir. We paint the States and counties so as to enable people to see at a glance without studying.
Q. Now, calling your attention to Exhibit B 3, this shows the section of the river above the locality in controversy?
A. Yes, sir.
Q. It has nothing whatever to do with the controversy?
A. Except as it may illustrate the mode of action of the river.
Q. Except as it may tend to illustrate your theory of the habits and character of the river?
A. Yes, sir.
Q. Now, this shows where the present channel of the Missouri river is, does it (indicating on map)?

A. Yes, sir.
Q. Where the dark, shaded lines are?
A. Yes, sir.
Q. These spaces colored yellow show land that has been formed?
A. It shows land that has been covered by the river.
Q. This change has taken place within the last forty years, has it?
A. Yes, sir.
240 Q. Indicate where the river ran forty years ago on this map.
A. This is the original channel (indicating). It is indicated upon this and the original Government survey.
Q. The channel indicated by the words "original Government survey"?
A. Yes, sir.
Q. The present channel is indicated on the map by the words "Missouri river"?
A. Yes, sir; and the shaded lines.
Q. In 1851 the river was in the shape of the letter "S," was it not?
A. Yes; very much that way.
Q. It now is nearly straight?
A. More nearly straight.
Q. How did the river get into this shape?
A. Well, by its usual manner of operation.
Q. By cut-offs?
A. I am not able to say whether that was by a cut-off or by erosion.
Q. Could the river by erosion change its course from that indicated by the original Government survey to its present channel?
A. Yes, sir.
Q. The river would be cut in here in section 21 (pointing to the outer bend of the lower bend on the map), would it not?
A. It did cut there once.
Q. Now, at this point the river would naturally be cutting into the outer bend?
A. I don't think so.
241 Q. How would the water come without striking something and being forced back? How would it turn almost at right angles and turn back, if it didn't strike some obstacle? What would force the river to flow back at an angle of 45 degrees?
A. That is the original survey, and that is the position at the time of this survey.
Q. Very well; I want to ask you this one question: What causes the water to fall back in this direction after coming in a southeasterly direction?
A. The collection of debris or drift-wood or something.
Q. The water would have to come against some object, wouldn't it?
A. Yes, sir.
Q. Would have to strike the shore of the river?
A. That would be difficult to say.

Q. It must have struck the shore?

A. No; I infer that a collection of drift-wood has shifted the channel.

Q. You say that the debris lodged in the river might have turned the water?

A. No; I say it might have done so.

Q. Is it not more probable that it might have done so than that the river might have been turned by its banks at that point?

A. I think there must have been something more than the ordinary bank itself to produce that change. There might have been such a lodgment as I say.

242 Q. We will come to the next bend above the bend we have been talking about. At this point the river seems to run in the southwest direction. At this point it turns and runs in a southeast direction about—at about the angle of 45 degrees. Now, against what must the water coming down the river strike to force it in the opposite direction?

A. Well, whether there was a temporary obstruction or a permanent hard bank I am not able to say.

Q. Is the same thing true at the next bank above?

A. Yes, sir.

Q. And also at the next bank above that?

A. The same causes are operating all the time and are to-day.

Q. So that you, as a witness and as a civil engineer and surveyor, and as a man who has made a study of the Missouri river, testify that, in your judgment and opinion, the river changed its course and direction as it run in 1851 to its present course and direction by abrasion and accretion and not by any sudden changes or cut-offs?

A. That is my belief.

Q. Calling your attention to Exhibit B 2, this represents a section of the river below the section in controversy?

A. Yes, sir; below Omaha and below Council Bluffs.

Q. What is the distance from Lake Manawa to the point where the cut-off occurred in 1877?

A. I think it is five miles.

243 Q. Now, what you have testified to with respect to the last map is substantially true with regard to the section shown upon this map?

A. Yes, sir; I was personally cognizant of all the changes therein shown.

Q. The present channel of the river is indicated on this map by the words "Missouri river"?

A. Yes, sir.

Q. Then in forty years the river had gradually abraded the Nebraska shore and built up on the Iowa shore?

A. In part; and the reverse again over here at the site of Manawa.

Q. Where is located, with reference to the survey of 1851, the U. P. R. R. bridge?

A. It is situated on the 40-acre line one-fourth of a mile north of

the township line between township 75, 44, and 74, 44; it lacks a little of being one-fourth mile north of that line.

Q. Where is the Iowa end of it located, with reference to the meander line of 1851?

A. The end of the bridge proper is west of the meander line of 1851.

Q. Where is the Iowa end of the Motor bridge located, with reference to the meander line of 1851?

A. The east end of the bridge proper is west of the Iowa meander line of 1851.

Q. This map has nothing whatever to do with the controversy except as it illustrates the theory of the defendants?

A. That is all.

244 Q. It throws no light upon the actual point in controversy direct?

A. No, sir; it illustrates the mode of action of the Missouri river.

Q. Are these maps all on the same scale?

A. Yes, sir.

Q. I will call your attention now to Exhibit B 1. The line marked meander line in 1851 indicates the Iowa bank of the Missouri river of that year?

A. Yes, sir.

Q. And the parallel black lines on the Iowa side of the present channel of the Missouri river the Iowa bank at present?

A. Yes, sir.

Q. This change from its location in 1851 to its location in 1891 has been brought about by gradual processes during those years, has it not?

A. I don't know whether it was gradual or not; the Missouri has done it?

Q. All of the spaces on the map colored yellow between the lines I have indicated has been worked over by the Missouri river in those years?

A. Yes, sir.

Q. In coloring the map yellow to indicate the extended accretions you have indicated the bed of the river in 1851 as well the present bed of the river?

A. Yes, sir.

Q. The actual land added to Nebraska from sections 21 and 22 would be shown between the Nebraska bank of the present
245 channel of the Missouri river and about midway between the two meanders, wouldn't it?

A. It would be represented by either similar bank.

Q. This is also true in regard to the land located in the vicinity of sections 1, 2, and 3 in Nebraska?

A. Yes, sir.

Q. Now, the left bank of the U. P. survey in 1868 represents a survey made in what month?

A. I don't think it is designated.

Q. The survey marked January, 1877, which locates the left bank

of the Missouri river of that year, was made at the lowest stage of the water, wasn't it?

A. I am not able to say. It would naturally be at that time of year. If it was in January and on the edge of the ice it would naturally be pretty low water.

Q. In your testimony, when speaking of Exhibit A, you stated that it showed the relative position of the two cities?

A. Yes, sir.

Q. Well, is it not a fact that the plat indicates simply the State of Nebraska and not Omaha?

A. Well, I had in mind the fact that it was all laid out in town lots and called it the city for that reason.

Q. So that you don't know whether it is the State of Nebraska or Omaha, Nebraska?

A. I don't think it is the State of Nebraska.

246 Q. You indicate on this map how it would be if our theory is correct, do you?

A. Yes, sir.

Q. Now, you don't mean to say that this plat would show where Omaha is, do you? That simply shows where Nebraska would be?

A. Yes, sir; that would be Nebraska land and East Omaha, as I understand it.

Redirect by Mr. STONE:

Q. Mr. Tostevin, you have referred to certain field-notes which you say Mr. Stone had furnished you and from which you made certain measurements which you testified about. Have you those maps in your possession?

A. Yes, sir.

Q. Will you produce them and attach them to your deposition as an exhibit?

Witness here produces a map marked Exhibit D and one marked Exhibit E and attaches them to his deposition.

Q. I will now ask you what these maps marked Exhibit D and E are?

A. These are not the identical maps, but they are fac-similes of the map that I worked from. They are authentic copies of the Government surveys.

Q. Certified copies?

A. Yes, sir; certified copies.

Mr. MCPHERSON:

Q. Mr. Tostevin, you were cross-examined and questioned quite a good deal with reference to the map Exhibit B 3 concern-
247 ing theories on which the channel was changed from the channel cut in 1851 to the channel cut now. You said it might have been caused by debris, but I want to ask you whether or not the land painted yellow has been occupied by the Missouri river?

A. That is what I understand by Mr. Allen's atlas.

Q. What is Allen's atlas?

A. It is a work published for the citizens of Pottawattamie county giving the details of all the occupants of the land and the owners, and other details.

Q. Do you know that map to be correct?

A. I have every reason to believe it is.

Q. Was Mr. Allen the official surveyor?

A. He was not at this time. He is a man of recognized ability in his profession.

Q. When you say this land was occupied by the river do you mean by the bed of the river or in overflows?

A. By the bed of the river.

Q. Was this the fact?

A. Yes, sir.

Mr. GREENE:

Q. This was taken from a map prepared by a private citizen?

A. Yes, sir.

Q. You don't know whether it is correct?

A. Not by actual examination.

Q. All you mean to say is that it is a copy of Pottawattamie county, and at times you have verified parts of it and know
248 it to be correct?

A. Yes, sir.

Q. You never have verified the parts shown here?

A. No, sir.

THOS. TOSTEVIN.

FENTON HARL, being duly sworn by the commissioner, testified as follows:

Direct examination by Mr. STONE:

Q. Where do you reside, Mr. Harl?

A. In Council Bluffs.

Q. Are you acquainted with the region of country occupied by what is now known as Cut-Off island?

A. Yes, sir.

Q. How long have you been acquainted with it?

A. Since the summer of 1865.

Q. Where did you live in 1865?

A. I lived on the bank of the river where the lake empties into it, south from Cut-Off island.

Q. By Cut-Off island you mean the land that now lies between the present bed and the old bed?

A. Yes, sir.

Q. How much of that island was formed from 1865 to 1877?

A. Cut-Off island?

Q. Yes, sir.

A. Well, I could not tell just exactly how much.

Q. Give your best judgment.

249 A. I should think there was about one-half of it.

Q. What was the habit of the river bank there from 1865 on as to its being preserved intact or as to its working away?

A. It washed away rapidly.

Q. Describe the process by which it fell into the river and washed away as well as you can.

A. In the spring of 1865 we had bought a piece of land there, and in 1866 we opened it up and farmed it. We bought it of Mr. Hammer. There was a brick yard upon it and two houses; one was a log house, weather-boarded. The river commenced coming in that spring and took in the crop and dragged down the house. We had to move our household goods and kept on pulling back the house back a short distance at a time. During that season there was 160 acres of land, and the river took it all off but about 15 acres. I had a lot of timber, and we had a boat fastened in what we called the eddy, and in the morning I went up and it was all gone. It took it all in that night; I suppose 65 feet of it.

Q. Boat and all went away?

A. Boat and all.

Q. This 160 acres was your land?

A. Yes, sir.

Q. Was there any other land?

A. There was below us Murphy and Jeffries.

Q. That was washed away also?

A. Yes, sir; when it got through with ours it took it.

250 Q. Did it wash away north of you?

A. Yes, sir.

Q. About how many acres did it cut off that season?

A. Well, I should judge it cut off somewhere near 200 or 300 acres.

Q. Now, during the season as that dropped off on this side what happened on the other side opposite?

A. It was making land on the other side. Of course you could not see it as long as the water was high, but when the water went down you could see it.

Q. How wide was the river when the water went down as compared to when it went up?

A. Some places it wasn't so wide, but on the average it held its own.

Q. How long have you lived there since 1866?

A. I have lived in the bottom most of the time since, except two or three years I have been away.

Q. Now, what happened at other seasons along this river and in this vicinity prior to 1877?

A. It just kept on cutting, I think, more the year it made that big cut-off, but it took all the balance of Mr. Jeffries' land up.

Q. About how many acres in any one season would it wash away?

A. I could not tell exactly the number of acres; I should judge there was something like (1,000) one thousand acres altogether.

251 Q. I didn't mean when the cut-off was made, but in strips during any one season.

A. All I can speak of would be right along at that point where my mind was drawn to it. I should think there must have been 140 acres went off that season.

Q. Which season?

A. In 1866.

Q. How wide a strip have you known to fall in any season?

A. I have seen it come off 15 steps. I stepped it myself—me and my brother.

Q. That would be at one time. How wide a strip have you known to drop off in the course of the season?

A. It would come off from 30 to 40 rods.

Q. Did you know anything about any timber along that country that fell in in the same way?

A. Yes, sir.

Q. Where was that?

A. That was up on the island.

Q. The island?

A. An island between the lake and the river?

Q. How much of that dropped off in any one season?

Objected to by Mr. Green as immaterial, being above the point in controversy.

A. There was timber on our own land that went in in 1866.

252 Q. Mr. Harl, how much of Cut-Off island do you think was made during the six years prior to 1877, when the cut-off was made?

A. I don't know. I think there was as much as half of it, as near as I could tell.

Q. How large were these trees that fell in at this time?

A. There were some of them three feet through; big cotton-wood trees, and different kinds, and some younger ones; nice young cotton-woods.

Cross-examination.

By Mr. GREEN:

Q. Mr. Harl, what was the description of your land?

A. I could not tell you that. I could tell you where the land was if we were there. Father bought the land from Mr. Hammer.

Q. When was it you bought the land?

A. In 1865.

Q. Your father bought it?

A. Yes, sir.

Q. What is his name?

A. Trammel Harl.

Q. Is there any way you can find out?

A. I don't know that there is. We came from the East. He got a quitclaim deed. He was not acquainted with that kind of business, and there was some dispute about it.

Q. Could you indicate upon the map where it was located?
A. I don't know.
Q. Do you know how many acres your father bought?
253 A. One hundred and sixty, I think he got a deed for. There was something over that called for by the deed—some two hundred and some odd acres.
Q. When did he sell it?
A. In 1865 father bought the land; he disposed of it in 1866 to the Missouri river.
Q. Did he ever dispose of any part of it?
A. No, sir; the Missouri river got it.
Q. You don't know anything, then, about what sections it was in?
A. I could not tell you the numbers of the land.
Q. Or where the river ran with reference to any section at that time?
A. No, sir.
Q. How far were you from Busha's house?
A. There were only two houses when we bought it—one near there and one down here.
Q. Did Bushas have a house in that locality?
A. No, sir.
Q. Was there a brick yard up there?
A. Yes, sir.
Q. Who owned the brick yard?
A. Mr. Hammer.
Q. Where was that located?
A. Right north of the east house.
Q. How far apart were the houses?
A. They were over one-fourth of a mile—well on to one-half mile.
Q. You say the brick yard was in what direction from the east house?
254 A. It was north of the east house.
Q. How far north?
A. It wasn't very far north. The house was a boarding-house for the hands, on the south of the brick yard.
Q. How far was it?
A. I suppose probably 200 feet.
Q. Was the house on your father's land?
A. Yes, sir.
Q. How far was the river from the brick yard?
A. Not so very far.
Q. Was the brick yard very near you?
A. Yes, sir.
Q. About how far was the river from it?
A. I should think it wasn't over 100 feet.
Q. So the time your father bought the land you think the river run within 100 feet of the brick yard?
A. Yes, sir.

Q. How far was the brick yard from the old bed of the river, known as the Lake View park?

A. I don't know anything about Lake View park.

Q. Did you know anything that was called a lake up there about this time?

A. On this side?

Q. Was there a lake east of the brick yard?

A. Yes, sir.

Q. How far was the brick yard from the bank of the lake?

A. This brick yard was right in the east section line of this piece of land, and the lake emptied into the river at this point.

255 Q. At this point?

A. Yes, sir.

Q. So the brick yard was on the east section line of the land you bought?

A. Yes, sir.

Q. And the old lake emptied into the Missouri river at that point, within a few feet of the brick yard?

A. Yes, sir.

Q. So that in 1865 the river must have run down through the center of section 22 (indicating on map)?

A. The river came along about here (indicating); the brick yard is righ- here (indicating). There is where the brick yard ought to be, so that the river came down here and cut around here (indicating on map).

Q. Your other house was on the west line of the land you bought?

A. I don't know how the land run; we never had it surveyed.

Q. Was your house, as a matter of fact, built near the west edge of your land?

A. I don't know how near.

Q. Don't you know how far west you would have to travel west from your house before you got on some one'- else land?

A. We knew where our east line was and the south line, but we didn't know where the west line was. The house wasn't

256 near the west edge of the land.

Q. About how far from the west side of your land?

A. I would not be able to answer just how far.

Q. The south line of your land was the east and west center line of section 22, wasn't it?

A. Yes, sir.

Q. And the east line of your land was the north and south side of section line of section 22, wasn't it, and the lake?

A. Yes, sir.

Q. The river bounded your land on the *the* north?

A. Yes, sir.

Q. And your west line was somewhere near the north and south line that subdivides the northwest quarter of section 22?

A. I suppose that is it.

Q. How far was it from your south line to where your brick yard was before you moved it back on account of the water?

A. Well, it was more than one-fourth of a mile.

Q. When you moved it about how far did you move it?

A. We moved it clear on the south line, and we moved it west between this line and the lower house. Then we had to move it again onto Murphy's land.

257 Q. Now, when did you move it first?

A. In 1866.

Q. When did you take possession?

A. In 1865.

Q. What month or season?

A. It was somewhere in the latter part of the season that we bought the place.

Q. What season?

A. In 1865.

Q. You mean in the fall or winter of 1865?

A. It was not in the winter. It was in the fall or summer.

Q. In the fall of 1865 you think you took possession of the land?

A. Yes, sir.

Q. Then you moved the brick yard some time in 1866?

A. Yes, sir; we moved the brick yard in the spring of 1866.

Q. In what month?

A. In the latter part of April.

Q. Was there a flood that spring?

A. Yes, sir.

Q. After the flood subsided did you move it or during the flood?

A. We moved it after the flood.

Q. When the flood began to go down and as the flood went down the land began to wash into the river?

A. Yes, sir.

258 Q. How far was your brick yard as it was located at the time you purchased the land from the bank of the river?

A. I think it was about 100 feet.

Q. How far was it from your brick yard when you moved off in April, 1866?

A. It was right up taking hold of the brick yard.

Q. So from the fall of 1865 until in April, 1866, the river had cut into your land nearly one hundred feet?

A. It had cut in in 1866.

Q. You then moved the brick yard south—nearly to your south line?

A. We moved it to the south line.

Q. When did you abandon the brick yard finally—what year?

A. It was in 1866.

Q. You moved away from the brick yard in 1866. What part of 1866?

A. In the spring of 1866 we moved the brick yard down there. We just put up two kiln of brick for Mr. Hammer. That is all the brick we made.

Q. When did you move it the second time?

A. It was in the summer. I don't remember the date.

Q. Was it in August or September?

A. No; it was not as late as that.

Q. Now, during the time this was cutting in you saw it cut, did you?

A. Yes, sir.

259 Q. Did you notice that the river when it was up high would soak the ground?

A. Yes, sir.

Q. Did you notice that the river would also wash out the under soil, leaving the surface or the crust?

A. I noticed that the ground was all saturated, and, of course, as it run down it was cut off in great slices.

Q. Now, what occasioned these great slides; wasn't it the fact that the ground had been undermined by the water?

A. No; I don't think so. I think it kept gradually working in.

Q. Which cut quicker, the hard or soft soil, sand or loam?

A. Sand.

Q. Now, the river, I understand, cuts under this surface, cuts out the sand first and leaves the surface standing for a short time?

A. I don't think it does.

Q. Why don't you think so?

A. For the simple reason that the river didn't go down so low along where it was cutting to the quicksands.

Q. The river would be cutting in high water just as well as low water, wouldn't it?

A. No, sir.

Q. The bank would be overflowed and all the water would necessarily be running against the bank, wouldn't it?

260 A. It would not cut as much as in lower water; not at all when the water was out of its banks.

Q. Don't you mean you don't see the evidences of it until after it has gone down? You don't see the effect until after the water recedes, do you?

A. No, sir; I don't know as I did.

Q. It may be cutting there, although it might not go down until the water goes down?

A. No, sir; I don't think so. I don't think it cut then.

Q. Have you ever gone down into the water to know what was going on?

A. No, sir; I have had no occasion to go down.

Q. On what theory do you know that?

A. The posts stood in the brick yard. If it had cut when the water was up it would have taken them out, but they stood.

Q. Don't you know, as a matter of fact, that the river cuts out under the surface, first undermines the ground and then afterward the ground slushes in back, fifteen feet perhaps? Don't you know that to be true?

A. No, sir.

Q. Now, didn't you testify a few moments ago that you had seen the land crack back away?

A. Yes, sir.

Q. And that you had gone back upon it?

261 A. No, sir; I didn't say I went.

Q. How far would it settle?

A. It would go clear out of sight.

Q. How would it settle if the ground underneath didn't slide out?

A. It slides right out.

Q. How long was the slant?

A. I don't know; I never measured.

Q. How steep a plane?

A. I don't know; according to the amount of earth that went off.

Q. State about the down slope.

A. I should say about three or four feet before it *before it* became straight as it was before.

Q. That is to say, the bottom of the bank would be 3 or 4 feet out from the top?

A. Yes, sir.

Q. You said it would crack back fifteen or twenty steps?

A. Yes, sir.

Q. Would that slope, 4 feet, give space enough to allow this space of 15 feet to settle out of sight?

A. It would do it.

Q. You don't really know much about the habits of the river, do you?

A. I know the habits during that time.

Q. You know the river cut out the land; how it did it you are not very well posted, are you?

262 A. I think I am; I know the facts and the process.

Q. It was timber land, I believe, wasn't it?

A. Not all of it.

Q. Most of it near the river timbered?

A. Some of it.

Q. How wide was the Missouri river at the point where you lived, opposite you?

A. That is something I could not tell exactly. To the best of my judgment I would say not over one-fourth mile.

Q. One-fourth mile wide, in your judgment? What do you mean—from where would you measure—from bank to bank?

A. I would measure from the water edge.

Q. How high was the bank on the Iowa side at your farm from the water's edge?

A. It was different heights; at low-water time I suppose about ten feet.

Q. How high was the water bank from the water in ordinary stages?

A. I don't know as I could tell exactly; probably 6 or 8 feet, take it right along.

Q. That is to say, if you would go up on the bank you would stand 6 or 8 feet above the water?

A. Yes, sir.

Q. Then you think it was one-fourth mile over to the corresponding bank on the opposite Nebraska shore?

A. Yes, sir.

263 Q. How high was that bank?

A. There was no bank there to amount to anything.

Q. What was there there?

A. It was made earth.

Q. How far back until you would strike a bank on the Nebraska side?

A. There wasn't much of a bank on the other side any place; it was a sand bar and lots of trees.

Q. How did you use to get across the river in those days?

A. We used to go across in a skiff, sometimes in a canoe, fishing and hunting in the fall of the year.

Q. You had occasion to go across considerable?

A. Yes, sir.

Q. How often?

A. We went across and got the wood that had drifted in on the other side.

Q. What other occasions?

A. We used to go hunting.

Q. What time of the year did you go hunting?

A. In the fall of the year.

Q. In what season?

A. In 1866.

Q. Did you go across in high water?

A. No, sir; I have been out on the river in high water.

264 Q. Now, the Nebraska side was covered with willows, grass, and other vegetation, wasn't it?

A. In some places.

Q. Then it reached out in a sort of a sand bar?

A. Yes, sir.

Q. Then you came to the water?

A. Yes, sir.

Q. Now, you only observed it there from the fall of 1865 to 1866, I believe; then you left your farm—or your farm left you—and where did you go?

A. We lived there—got another piece of ground on the south.

Q. Now, this sand bar would be up above the water in ordinary stages?

A. Yes.

Q. Grass and willows begin to grow, would they not?

A. Yes, sir; after awhile.

Q. And as the grass and willows grow the sand lodges and it begins to fill, doesn't it?

A. Not so much as on account of the overflow of the river.

Q. Still it does appear to fill some, doesn't it?

A. Well, not much.

Q. There is a good deal of wind from the Missouri river bottoms?

A. Yes, sir.

Q. Great deal of sand, isn't there?

A. Yes, sir.

265 Q. When you ride across the the river in a windy day isn't there a great deal of sand in the air?

A. It lodges, but you don't see any effect.

Q. Don't you know as a matter of fact that it is all the time filling up these places among the willows and grass?

A. Well, it travels like it does in Nebraska, where it lands.

Q. Are there not several banks on the Missouri river—the water bank, the second bank, and yet a third bank?

A. I believe so.

Q. Now, the sand coming along, wouldn't it strike against the lower level and lodge there and fill it full?

A. It might.

Q. Then come these overflows of water and you see the sand bars growing higher?

A. It would be building up on account of the earth which washed in.

Q. Certainly. Now, there would come a freshet of high water and when the water went down there would be a lot of sand on that bar building it up?

A. There would be a sand bar.

Q. It would be higher than before?

A. Yes, sir.

Q. How about where it was already exposed before the freshet, wouldn't there be a deposit there?

A. Yes, sir.

266 Q. Then, in addition to building up the old sand bar, there would be a deposit building it up during the year and toward the Iowa shore?

A. Yes, sir.

Q. That deposit would take place while the water was up, wouldn't it?

A. I don't know as it would; the water is too swift.

Q. How would it take place when it got down?

A. Because——

Q. Then the river on the Iowa side cutting on the opposite shore would be too swift?

A. It is when the water is going down that the land is cut and that the deposits are made on the opposite side at the same time.

Q. But in order to deposit the water must be going down?

A. Yes, sir.

Q. Then the deposits take place when the water is up, do they?

A. No, sir.

Q. All deposits must be left by water?

A. Not necessarily.

Q. Could you deposit sand on this table by water without water?

A. Yes, sir.

Q. How could you do it?

A. By my hand.

Adjournment was here taken until 2 o'clock p. m.

Pursuant to adjournment the further taking of testimony was continued:

267 Q. You say that at the time you bought the land the brick yard was located about here (indicating a point about 300 feet south of the east and west subdivisional line through the north one-half section 22); and you say also that the river was within about 100 feet north of where the brick yard was located?

A. Yes, sir.

Q. The point indicated on the map is in Government lot 1 of tract and section 22, is it not?

A. Yes, sir.

Q. Your father got that land in 1866, didn't he?

A. In 1865.

Q. Do you know whether he got the deed at the time he took the land?

A. I don't know how soon he got the deed?

Q. Did he ever get the deed?

A. Yes; he got a quitclaim deed.

Q. In what general direction was the river running right at the point near your brick yard? It was flowing in a southwesterly direction and bending gradually to the northwest, wasn't it?

A. Yes, sir.

Q. Making what you call a bend in your lands—making a bend similar to the bend indicated on this map (indicating)?

A. It made a small bend.

Q. Not sharp, a small bend and a bend like the bend indicated on Exhibit B?

A. No, sir.

268 Q. After you moved the brick yard back near to the south line of Government lot No. 1 you burned two kilns during the summer, and that is all you burned?

A. Yes, sir.

Q. Were those kilns burned here at the second location?

A. At the first and second locations.

Q. When did you move it the second time?

A. It was along during the summer; I don't remember what month, but in the early part of the summer; it wasn't after the river went down.

Q. Then you moved it further west?

A. South.

Q. You moved it the first time south, didn't you?

A. We moved it south and west the first time.

Q. The second time?

A. We moved it south and west.

Q. Did you burn any after you moved it on the land of Murphy's?

A. Yes, sir; we burned one kiln there.

Q. At the time that you went out on the land the river was flowing pretty well down toward the centre of the section, wasn't it?

A. It was hugging the shore; that bank right there (indicating).

Q. And that bank went down through near the centre of the section?

A. No.

Q. Pretty near the centre, wasn't it?

A. No; the strip of land was as wide out here as when we bought it.

269 Q. Where was the river cutting most during 1865 and 1866?

A. Here and here. (Witness points in the southern portion of the north half of 22, near the centre of the section.)

Q. Isn't it true that the land your father bought of Mr. Hammer was Government lot 1 and 2, in fractional section 22, and the west one-half of the N. E. one-fourth of that section? You owned this and this and this? (Counsel indicates Government lot- 1 and 2, on the north one-half of N. E. one-fourth of section 22, all in said section.)

A. -es, sir.

Mr. STEWART:

Q. You are simply speaking in a general way as to that part of that section that your father owned?

A. Yes, sir.

Q. You didn't know at that time what section it was, and don't want to be understood as swearing now as to what section it is?

A. No, sir; I never knew the number of the land and never made any inquiry.

FENTON HARL.

M. S. CLAUSSEN, being duly sworn, testifies as follows:

Direct examination by Mr. STUART:

Q. What are your initials?

A. M. S.

Q. Where do you live, Mr. Claussen?

270 A. I live on 37th St. and Avenue A, Council Bluffs, Iowa.

Q. How long have you lived in Council Bluffs?

A. I have lived in Council Bluffs, I think, since 1867. I would not be positive about the year.

Q. From what country did you come to this locality?

A. From Rock Island county, Illinois.

Q. In what year?

A. In 1865.

Q. Where did you locate in the year 1865?

A. In Omaha.

Q. In Omaha, Nebraska?

A. Yes, sir.

Q. In what business were you engaged at that time?

A. The first part of 1865 I was rafting lumber for Capt. Overton from Cincinnati.

Q. From Cincinnati, Iowa?

A. Yes, sir.

Q. To where?

A. To Council Bluffs and Omaha, on the Missouri river.

Q. You say that was in the year 1865?

A. 1865.

Q. Are you acquainted with the land and its surroundings usually known as Cut-Off island?

A. Yes, sir; I am—that is, the features of the country, but no numbers or names of property. I have known them since 1865.

Q. Were you acquainted with the Missouri river in that vicinity at that time—in 1865, '6, '7?

271 A. Yes, sir.

Q. In what business were you engaged other than rafting lumber from Cincinnati to Omaha?

A. In the latter part of 1865 I went to pilot on a steamboat; that was my business.

Q. Are you acquainted with the action of the Missouri river in that vicinity as to carrying off portions of land and washing it away?

A. Yes, sir; I am.

Q. Were you so acquainted with it from the year 1865 to 1877?

A. Yes, I was acquainted with it during all that time.

Q. What is the fact as to your cutting and hauling wood? Were you engaged in that business?

A. Occasionally; what I required to use at home; never for market.

Q. What have you to say as to the width and length of sections of land that you have known the river to have washed in along about the year 1865 to 1867?

A. The sections of the land I know nothing about, only the features of the river bank as I would pass it from day to day.

Q. What is your experience as to seeing the land cut off in large quantities or small ones?

A. I have seen in this bend north of us, south of Cut-Off island; I have seen the bank going in there pretty rapidly.

Q. State in a general way about how rapidly.

272 A. I have seen pieces of land go in there I am satisfied were all the way from 20 to 25, perhaps 30, feet wide. There would be a strip 50 feet wide crack off and stay there, perhaps, for several hours before it would fall off and the current might change.

Q. Frequently cut the road out?

A. Yes; it would cut the road out while we would go up for a load of wood.

Q. Then how would you get back?

A. We would usually cut off the willows, and went back through them.

Q. Was that a frequent occurrence, you to have to cut your way back?

A. It was quite frequent, but not every day.

Q. Was this cutting you speak of confined to any particular time, as to a week, or was it the whole year through, or how was that?

A. Well, it cut after the high water; at least we could see it

plainer after high water than at any other time; it cut all the time; even at low water some.

Q. Have you ever known it to cut out the land so rapidly that it was necessary to move houses or anything of this kind?

A. I did on the east side, in Iowa, fronting the Smelter.

Q. What was that?

A. That was a big boarding-house.

Objected to as immaterial.

Q. How far was that boarding-house from the river when you first knew it?

273 A. When it was first built I should judge it was 100 feet, perhaps. We landed with the steamboats just below it.

Q. Do you know how long the river was in cutting that 100 ft.?

A. No; I don't know the number of days; it was but a short time.

Q. Did you help to move the house?

A. No, sir.

Q. Did you see it moved?

A. I did, sir.

Q. What was the occasion of moving it?

A. The bank was washing in. They had to get back from the bank to keep from going into the river.

Q. How did they get it away?

A. They got a couple of barges; tore the building down and put the lumber on them.

Q. Why did they do that?

A. They could not get it back as fast as the river was cutting in at that one point.

Q. You say you have frequently driven up on this side of the river at the time this cut was going on?

A. Yes, sir.

Q. Did you usually carry an ax with you?

A. Yes, sir.

Q. Why was that?

A. For two reasons: We needed it to cut wood and sometimes to cut a road around.

Q. Why would you need to cut a road?

274 A. As I said, the river sometimes washed the road away, and we would have to cut through the willows to get back.

Q. What is the fact, Mr. Claussen, as to the amount of land that would be formed on the opposite side as to that which would cut off on this side?

A. Well, according to my idea, it would universally correspond with what was cut off on the opposite side. We would not see it in high water, but as soon as the water went down we would see that bar formed.

Q. What is the fact, Mr. Claussen, as to the river retaining about the same width?

A. I cannot see any difference in the width of the Missouri now than when I first came here.

Q. It is about as wide now as in the year 1865, when you came here?

A. As far as my remembrance goes, I don't see any difference.

Cross-examination.

By Mr. GREEN:

Mr. Claussen, you wer- navigating the river in this vicinity for a number of years as pilot?

A. Yes, sir.

Q. And your observations were generally made from your boat?

A. From my boat, and we frequently landed at different points.

Q. And what you carry in your mind was the relation of the river bank to the river and not relation to surveyed lines or anything of that kind?

A. No; I don't know anything about that.

275 Mr. STEWART: In what addition did you settle when you came here?

A. In Ferry addition, on the Iowa side.

Mr. GREEN:

Q. This river, then, was cutting into the Iowa shore, in sections 21 and 22, wasn't it?

A. It was cutting into those sections; yes, sir.

Q. It was also cutting into sections 2 and 3, on the Nebraska shore, wasn't it?

A. Yes, sir.

Q. So that in the locality of section 22 the river was moving south into Iowa, and in the locality of section 2, Nebraska, it was moving north into Nebraska?

A. Yes, sir.

Q. How long did the river continue to cut in these directions?

A. Well, until 1877.

Q. What occurred then?

A. It cut through.

Q. You were not here when the river first commenced to cut into section 22?

A. No, sir.

Q. What cutting may have been done into 22 before that you don't know?

A. I don't know anything about it.

Q. Or what cutting may have been done in section 2, Nebraska, you don't know?

A. I don't know anything about it.

Q. All you know is subsequent to 1865?

A. Yes, sir.

Q. Then the cut-off occurred?

—. ——.

276 Q. It is not true that since the cut-off the river has still continued to cut on the Iowa shore south of section 22?

A. Certainly; not so rapidly; the river is straight and does not cut so rapidly.

Q. Now, Mr. Claussen, you describe the river at times as cutting quite rapidly. I will ask you when were those times?

A. Usually along after high water; I have seen it cut when the water was down.

Q. But these extraordinary cuts generally occurred after high water?

A. Yes, sir.

Q. High water usually occurs on the Missouri during the months of April and June?

A. Yes, sir.

Q. We call one the April rise and the other the June rise?

A. Yes, sir.

Q. And when you speak of high water you mean those rises?

A. Yes, sir.

Q. And other seasons the river remains in about the same condition?

A. Yes, sir.

Q. Now, it was cutting in both these places I have indicated constantly, wasn't it?

A. Yes, sir.

Q. Now, how do you explain these processes of cutting?

A. My theory is it is undermined.

277 Q. That is to say, the river cuts away the soil beneath the surface to a considerable distance back, then the surface slips into the river?

A. Yes, sir.

Q. Generally, before this slipping and sliding takes place there is a crack in the earth?

A. Yes, sir; about 15 or 20 feet back.

Q. And then pieces slide down and that is taken and carried away?

A. Yes, sir.

Q. All of this earth that has been cut out of the Iowa side in the locality of section 22 has been moved further down the river, has it not?

A. Certainly.

Q. Describe how land is formed in the Missouri river.

A. Well, in those bends where they make short bends—well, it is very slack water.

Q. What occurs then?

A. This deposit swims around in the river and settles there.

Q. The Missouri river, in high water, carries in suspension a larger amount of matter than in low stages?

A. Yes, sir.

Q. And wherever this water ceases to agitate deposits commence, do they not?

A. Yes, sir.

Q. So where the river would be cutting into one side it would be because the main current of the river is on that side?

A. Yes, sir.

278 Q. As a fact, in this case, the currents of the Missouri river were against the Iowa bank in the locality of section 22 during all the time you speak of?

A. The main channel was right along that bank (indicating on map).

Q. How deep was the main channel?

A. I have sounded and could not get bottom at 50 feet.

Q. Was this an unusual depth?

A. Yes, sir; but there were places we could not get sounding at all.

Q. I want you to give the general depth of this river where it was cutting into the Iowa shore.

A. I think in 1867 there was not less than 45 or 50 feet from the foot of Big lake here to where it strikes the Nebraska shore (indicating on map).

Q. During the year of 1876, from what you call the Big lake and what is marked on Exhibit B as Lake View park around to Nebraska in the vicinity of section 3, the current in the Missouri river next to the Iowa shore in 22 and the Nebraska shore in 2 and 3 was, you would say, 45 feet deep?

A. I think it was, sir.

Q. And at high water the water would run very rapidly, would it not?

A. Yes, sir.

Q. More so than at ordinary stages?

—. Yes, sir.

Q. Come with a great volume and great force?

279 A. Yes, sir.

Q. You had difficulty in navigating the stream at this time?

A. Yes, sir. Sometimes we could hardly make it with a steamboat.

Q. All of this water, then, of course, cutting the bank the entire length and taking in all the accumulations from some of the shores, would be very muddy, would *they* not?

A. Yes, sir.

Q. Now, opposite the water would be more or less still, wouldn't it?

A. There would be some current, but we call it slack water.

Q. You could not see the deposit?

A. No, sir.

Q. It was imperceptible, wasn't it?

A. Yes, sir.

Q. But when the water began to subside you could begin to measure it?

A. We would find a bar formed on the opposite side.

Q. Now, when this bar is formed already subsequent waters deposit their additional earth?

A. Yes, sir.

Q. Weeds and grass and willows spring up?

A. Yes, sir.

Q. Therefore, Mr. Claussen, from your knowledge and observation during your years upon the river, isn't it true that the lands formed were formed by accretion?

A. Most of it was.

280 Q. You cannot see a second hand move on the face of a clock dial, can you, by looking at it? But after it has moved awhile you can see the result, can't you?

A. Yes, sir.

Q. Now, is it not true that the formation of land in the Missouri river takes place in about the same way and can be discovered in the same way as the movement of the hands on the face of the clock dial?

A. In about the same way.

Q. You never saw a particle of earth come along down and lodge anywhere in the water?

A. No, sir.

Q. Where the river cut through in 1877 this current flowed right over to the smelter?

A. Yes, sir.

Q. Now, Mr. Claussen, about the river maintaining its width, has the river in any great degree infringed on the Nebraska shore in front of Omaha in the last few years?

A. Not in the last few years.

Q. Since when; since 1877?

A. Some little—not much.

Q. The river, practically, in the last 15 years in the vicinity of Omaha has been about the same, hasn't it?

A. Yes, sir.

Q. But right opposite there has been a bar or wall of land formed in those years something like a mile in length and one-fourth to one-half in width?

281 A. Yes, sir.

Q. There was a time before the floods that that river was a great deal wider than now?

A. In 1865 it was wider; there were two channels.

Q. So that the river would build accretions on one shore without cutting away the other?

A. It has not done it there; it most usually cuts away on the opposite side.

Q. Didn't you explain that by showing that the river in such cases wears the channel deeper?

A. Well, that is owing to the bed of the river.

Q. If the river narrows at any point it would have to deepen?

A. Yes; generally speaking, it does.

Q. What is true of one part may not be true of another?

A. Yes, sir.

Q. It is hard to generalize the habits of the Missouri river?

A. Very hard.

Q. There are so many features in the conclusions it is pretty hard to say because a thing is true to-day it is true to-morrow in the matter of cutting and filling; but, as a matter of fact, from your obser-

vation *of* the cutting and filling in the locality in controversy have been done as you described it?

A. Yes, sir; it has.

Redirect—Mr. STEWART:

Q. Mr. Claussen, as a matter of fact, the bank has an artificial protection on the side of Omaha by the smelting works?

A. Yes, sir.

282 Q. Do you know what that is made of?

A. A great deal of it is slag and some rocks.

Q. They have been so protecting the bank by artificial means to protect it from washing?

A. Yes, sir.

Q. Did I understand you to say you were a pilot on this river?

A. Yes, sir.

Q. When did you say you commenced that business?

A. In the latter part of 1865.

Q. Now, Mr. Claussen, how long a time were those very rapid cuttings of the river that you have observed carried on? How long would it continue each time?

A. I could hardly answer that correctly; but it cut the whole season around more or less, but right after high water the river cut more rapidly.

Q. About how long after high water would that rapid cutting continue?

A. About two weeks or a month, until the water got out of the ground.

Q. About how many feet or rods or yards would be taken in two or three weeks after high water?

A. I could not answer correctly, but a good deal. Some points would be 100 feet, some 200 feet, perhaps more.

Q. Now, would you mean 200 feet in what length of time?

A. Say ten days or two weeks.

283 Q. How long did you say it was continued—a month?

A. Well, it might not cut any more at one point, but would move up or down the river and cut another.

Q. I mean how many feet of the bank would it usually cut off at this rapid rate in one spring.

A. It would cut off a couple of hundred feet in one year—some years more than others. I think in 1867 it cut more than any other year; 1866 and 1867 it cut more than any other years.

Q. Have you any idea of the number of acres of land that was formed on the other side of the river in what was known as Cut-Off?

A. I haven't the least idea.

Mr. GREEN: The maps will show that.

Q. If there was 200 or 300 cut off in a week or ten days would there be about an equal amount formed on the other side?

A. In time of high water; yes, sir.

Recross—Mr. GREEN:

Q. The forming of the land is during the high water, is it not?

A. Yes, sir.

Q. And the cutting is after high water?

A. Right away after the water begins to go down the banks cut. When the water is over the bank it cuts some, of course, but to look at the general feature of the river you would say it has not cut, but it cuts all the time, and when outside its banks cuts rapidly.

284 It will correspond around one of these long bends and keep it the same shape.

Q. There is no time in your recollection that you could stand and see land forming, could you?

A. No, no, no; it was always during high water, you understand. When low water came I could see the bar that had formed.

M. S. CLAUSSEN.

R. V. PHILLIPS, being duly sworn by the commissioner, testified as follows:

Direct examination by Mr. STEWART:

Q. Where do you live, Mr. Phillips?

A. Council Bluffs.

Q. How long have you lived in Council Bluffs?

A. Since 1859.

Q. Moved here in 1859?

A. Yes, sir.

Q. Where from?

A. Jackson county, in this State.

Q. Where did you settle?

A. In the First ward, this city.

Q. You say you settled here in 1859. What time in the year?

A. I came out in the spring, and in the fall I moved my family out.

Q. In what business were you engaged after you came here?

285 A. For the first year I was working here in the Bluffs, making hay and making brick.

Q. Where were you making hay?

A. Down where Lake Manawa is now.

Q. Are you acquainted with the manner of the Missouri river washing away its banks and forming the land upon the other side?

A. Well, somewhat. I know where it has made and where it has lost.

Q. Give us a general idea of how that is done.

A. At the time of high water—after high water, when the water is receding, then is the time that it cuts the worst; that is why the land comes on the other side. It makes a bar at the time that loss is making on this side. Then it grows up to willows. The land is made principally by the sand blowing in.

Q. Blowing in or washing in?

A. Blowing in in winter.

Q. That is after the sand bar forms?
A. Yes, sir.
Q. Do you know what section of land you worked on in mowing hay?
A. On what was called Warehouse tract.
Q. How many acres were there of it?
A. I think there was 160.
Q. Is that the land you spoke of as having been washed away?
A. I should think nearly one mile of that has washed away there.
Q. About how wide a strip back into the country?
A. I think about a mile.
Q. About how long a strip?
286 A. I don't know how far it extends below. Over a couple of miles.
Q. How long a time was that land washing in?

All objected to as irrelevant.

A. I was hauling goods in 1862 up to the time the railroad commenced coming in. Then they got the goods by railroad, and I frequently seen them moving the warehouse back, and I seen them move the R. R. back after that was built.
Q. How often did they move the R. R. tracks?

Counsel for plaintiff objects to all the testimony offered with respect to the locality in question as irrelevant and immaterial.

A. Well, I could not tell you. I should think several times—probably four or five times in a season. One time they moved it twice in about a week.
Q. How far was it built from the river originally? Do you remember?
A. I think about 80 rods.
Q. How long was the river in cutting away that 80 rods?
A. I think, perhaps, it must have been ten years.
Q. What is the fact as to the river remaining about the same width there as it was before it cut this 80 rods off?
A. I don't know anything about the river. I don't think it changed the width of it very much.
Q. Have you any experience, Mr. Phillips, with the action of the river in this respect near Cut-Off island?
287 A. I used to furnish the ferry company with wood. I bought a tract of timber. It is above this island.
Q. It wasn't on the east side of the river opposite Cut-Off island where you got your timber?
A. Yes, sir. In 1868 I bought the tract of timber of the ferry Co. I sold the logs to Brown on bank, 75,000 ft., at the north of the lake to run to his mill, but he lost those logs. There came high water in March or April, and they all went off.
Q. Where do you say that mill was located?
A. On the Nebraska side, close to the bluff, to the high ground.

Mr. GREEN:

Q. Near Saratoga sulphur springs?
A. Yes, sir.

Mr. STEWART:

Q. How long did you haul timber for this ferry company?
A. About four or five years.
Q. Do you remember the year you commenced?
A. No; I don't believe I do.
Q. About when was it—how long after you came here?
A. I think I commenced hauling timber for the ferry company in 1862 or 1863. There was a tract of timber I bought of the K. C. Company.
Q. On which side of the river was that on?
A. On the Iowa side.
Q. Did you have a personal observation of the banks of the Iowa side washing into the river?
A. Well, some. I seen them falling in.
Q. Was that during the time you were teaming up and down the river?

288 A. Yes; and while I was cutting hay.
Q. About how rapidly would that cutting be?
A. About as rapidly as was described by the old gentleman here.
Q. About how much in a day?
A. I could not tell. I never noticed it cutting much except after high water.
Q. About how much would you see drop off at one time?
A. Fifty feet—a strip longer; sometimes it would slide.
Q. About how much of it would go during one time after high water—that is, during the time that this rapid cutting would take place?
A. I could not tell you.
Q. Can you give us some idea of it?
A. I have frequently been up there with teams and my teamsters, when we had to cut our way back when it was flooded—perhaps a rod or two back from the river bank. I kept away as much as I could from the bank. I didn't like to drive along. One time I noticed a crack when I was 2 or 3 rods from the river. I hitched the team and went back, and there was a large cotton-wood tree there and it began to go down, and I watched it go until it went out of sight.
Q. About how wide did it cut out?
A. I think about two or three rods.
Q. How many years were you in the business of hauling wood along the river?

A. About ten.
289 Q. About how much land did it cut off in rods, measured from the river bank, during that eight or ten years? Any place opposite Cut-Off island that you have observed?

A. I think that whole change was made from where that mill I speak of in ten or twelve years.

Q. That is, the principal part of the land on Cut-Off island was made in ten or twelve years?

A. What was made on the other side I don't know, but at that time there was a high bank where it was washing and falling in north and east of that mill on the Nebraska side, the same as it was on this side on the Bashas farm.

Q. Are you acquainted with the land on Cut-Oft island and its location?

A. I haven't been there for 25 years.

Q. You are not able to say how long it was in forming?

A. No.

Q. What have you to say as to the river maintaining its width opposite Cut-Off island; or, in other words, is there any difference between the width of the river now and the time you have been testifying about?

A. I don't think—with the aid of ripraps or something—it makes much change.

Q. That is the history of the Missouri river in this locality, that it maintains its width?

A. Where it makes it gradually.

290 Q. Then your experience is that it falls in one side about the same proportion that it fills in on the other?

A. Yes, sir.

Cross-examination.

Mr. GREEN:

Q. You have seen a piece go into the river, about a 50-foot section?

A. Yes, sir.

Q. There was a tree growing in the centre of that piece higher than any tree in town, you say?

A. I think it was.

Q. Now, Mr. Phillips, give us an idea of about how high that would be.

A. It must be over 60 or 70 feet.

Q. And did it go straight down?

A. It went straight down.

Q. You say it gradually sunk?

A. Yes; when the water came on it went very rapidly.

Q. And the last you saw of it the branches disappeared—they appeared to be standing perpendicular?

A. Yes, sir.

Q. Would that not indicate that before the earth cracked there had been a great hole undermined there filled with water that might have been 65 or 80 feet deep, and as much as the area of ground it took in?

A. Yes, sir; it might have been larger.

Q. So that all of the phenomina of the dropping in of the
291 land *land* is explained upon the fact that before the land fell down there had been these great spaces undermined. These spaces were undermined, and *of* the time it required to do it is a matter of conjecture, is it not?

A. It depends on the nature of the soil; where it is sand it goes very rapidly.

Q. The greater portion, then, of the land has been undermined and washed away by the action of the waters before the surface falls in?

A. Yes, sir.

Q. Mr. Phillips, you spoke about sand blowing; describe that.

A. I have seen the sand drifted fifteen or twenty feet high and a quarter of a mile long. I think the sand does this way on the bottom. In 1881 if it hadn't been for the action of the wind making sand levees the water would have been all over the bottom; the trees grow up, the sand blows in around them. On this road leading up to the island I have seen the sand drift and the sand blow up until we would have to cut a road to get around the bank. The high ground on the bottom is all made by the wind blowing the sand or where the sand-storms plow in.

Q. But the creation of the sand bar in the first instance is done by deposits?

A. It is done by the slack water.

Q. Now, anything may occur in the Missouri river in regard to cutting away land or forming land?

A. Various causes create the bars.

292 Q. This circumstance that you relate has nothing to do with regard to the changes in the land in controversy?

A. No, sir.

R. V. PHILLIPS.

293 JOHN HAMMER, being first duly sworn by the commissioner, testifies as follows:

Direct examination by Mr. STONE:

Q. How long have you resided at Council Bluffs, in this vicinity?

A. Since 1855.

Q. Were you familiar in its lifetime with what is known as Busha's farm?

A. Yes, sir.

Q. When did you know it?

A. In 1855 and 1866.

Q. What afterwards happened to it?

A. Well, I bought it.

Q. What happened after that?

A. It commenced disappearing on the north side until it was all gone. It wasn't all gone when I sold it, but it went since.

Q. How many acres were there of it?

A. Something over 200.

Q. How long was it in falling into the river?

A. Well, from 1863 up to about five years ago, I guess.

Q. Where was it situated?

A. In section 22.

Q. How long have you known the manner and operations of the Missouri river?

A. Well, I have seen it, more or less, since I have been here.

Q. Are you familiar with the process by which it falls in on one side and forms on the other?

294 A. Yes, sir; somewhat.

Q. State them as nearly as you can.

A. Well, whenever there is high water it didn't show it washed much, but as the water goes down the sand is undermined by the current. It doesn't roll off, but just undermines, and there is about 8 or 12 feet of this gumbo, and it just cracks off and drops in.

Q. It holds together in strips until sufficient space has been undermined, then drops off?

A. Yes, sir. There is generally sand under that gumbo, and the current and that water will wash it out; then it will drop down & off.

Q. How wide a strip have you known to wash in in the course of one flow?

A. Perhaps 75 feet. In one flow you mean? But I have seen more than that.

Q. How much in one or two weeks' flow? It varies, does it not?

A. Wherever there is a bend it falls off more than in any place.

Q. It washes away most rapidly in the bends, doesn't it?

A. Yes; most always; but forms opposite and throws the current right in the opposite direction.

Q. Now, as ground washes in on one side what is happening on the other?

295 A. It generally forms a bar on the opposite side and makes the land on the other side. The same dirt don't form there, exactly. It is the muddy water that settles on these islands. The channel keeps about the same all the time. There is no difference between 1855 and to-day.

Q. Mr. Hammer, taking into view, now, this area where Cut-Off island is, about how wide or how long a strip or area of land in there has been covered—that is, has been used as river bed during the last 20 or 30 years?

A. I should judge about one-half of it.

Q. Are you able to say how much of it, or about how much of it, fell in in any one year or any one season?

A. I don't hardly know. I think there has been as much as 40, 50, and 60 acres in one year off that particular section.

Q. Now, during the times that this washing would be the greatest what portion of the year would the falling in of the land on one side be the greatest?

A. It does not wash in much after the water is low.

Q. It is in what you call the spring rise?

A. Yes, sir; from April to about the first of July.

Cross-examination.

By Mr. GREEN:

Q. I will ask you, Does that show the Bashas' farm?

296 A. Yes, sir.

Q. The Bashas' farm was made up of lots 1 and 2 and the west one-half (½) of the N. E. one-fourth (¼) of section 22, and the S. E. ¼ of the N. W. one-fourth (¼) of section 22 also?

A. Yes, sir.

Q. Now, did you sell some of this land to Harl?

A. Yes, sir.

Q. When did you make the sale?

A. I think it was in 1865. I believe I bought it in 1863. I don't remember. We started a brick yard.

Q. You sold this, you think, in 1865 to Harl?

A. Yes, sir.

Q. You gave him a bond for deed, didn't you?

A. I think so. I don't remember that.

Q. And that bond for deed was dated January, 1866, wasn't it?

A. Perhaps so. I don't remember much about it.

Q. You gave the bond the time you made the sale?

A. Yes, sir.

Q. Then afterwards the bond was cancelled, wasn't it?

A. Yes, I presume it was.

Q. Do you remember when it was cancelled?

A. I do not.

297 Q. The records of Pottawattamie county would show, wouldn't they?

A. I presume they would.

Q. Why did you cancel it?

A. I suppose it was paid for.

Q. Did you execute a deed afterwards?

A. I think I did—I know I did.

Q. This land that you sold to Harl didn't include the S. E. of the N. W. one-fourth (¼), did it?

A. I don't know whether it did or not, and I don't know but it did. My opinion is it did.

Q. This shows it didn't.

A. Well, perhaps not, if the record shows not.

Q. When did you get it, in 1863?

A. Yes, sir.

Q. When you bought it from Bashas in 1863 considerable had been washed out, hadn't it?

A. It had been washed away some, but not much.

Q. It continued to wash; then you sold to Harl?

A. Yes; and for one or two years it seemed to wash worse than ever.

Q. The fact is that the river has been washing away that farm from the time it was originally surveyed until now?

A. Yes; I guess most of it is in the river.

Q. This is your observation and opinion, that the river under-

mines first, creates great cavities below the surface of the
298 ground, which cannot be seen. We do not know how this is done, but that is all we know, and when these freshets come up, then the ground cracks back a distance and the ground sinks down into the river; then you would see the river washing it and cracking it away?

A. Yes, sir; a kind of a whirlpool carrying it away.

Q. Then it would commence at some other point of attack and that breaks down; so around the bend of the river, and the result of this rapid breaking down is to make the banks somewhat uniform and it commences over again?

A. Yes; it commences over again and gouges out in some place.

Q. Where it breaks out it forms a sort of a shoulder sometimes where the waters come?

A. Yes.

Q. On the opposite side of the river the land forms as it was being carried away on that side?

A. The other side is a sand bar.

Q. The sand bar made by deposits?

A. Yes.

Q. The material would be carried in suspension in the waters?

A. Yes; then it grows up with willows and dirt settles in, layers of earth and sand build in again, and thus build up.

299 Q. The original and first sand bar is made by deposits?

A. Yes, sir.

Q. What are these deposits.

A. Mostly sand and some mud with it, which holds it.

Q. When the river was cutting on your side the body of the river or current was hugging the Iowa shore?

A. Yes, sir; on the other side the land would be covered.

Q. Was it still water?

A. Yes, sir.

Q. What would be a fact of this water being still about precipitating material held in suspension? Would the material be deposited and make a sand bar?

A. Yes, sir.

Q. That would be a slow and gradual process, wouldn't it?

A. Yes, sir.

Q. How wide was the main channel of the river?

A. I could not tell.

Q. How wide was the current—the principal current?

A. It must have been—I don't know. I don't believe I could guess very good on that—several hundred feet.

Mr. STONE: Now, Mr. Hammer, you have described how this land was made up in that country. I will ask you if that
300 is the way the land in Cut-Off island was made.

A. Yes, sir; it was made there by deposits of water.

Q. By the forming of sand bars and deposits?

A. Yes, sir; that is it.

JOHN HAMMER.

GEORGE H. KEYS, being first duly sworn by the commissioner, testified as follows:

Direct examination by Mr. STONE:

Q. Where do you reside?

A. In East Omaha, on Wood avenue is the name of the street, according to the plat, about a block from 9th and Locust. According to the original plat I believe it is Fifth and Locust streets.

Q. How long have you been familiar with Cut-Off island?

A. More or less so since 1870.

Q. Are you familiar with the processes or operations of the waters of the Missouri river by which this land was made over there?

A. Some portions of it; yes, sir.

Q. You may state how it is done, as well as you understand it.

A. My observation is that the cutting always occurs im-
301 mediately after high water. The water supports the banks when the river is high, and there is no material change observable. As soon as it falls or recedes it will cut. When the river ran in its channel formerly before the cut there in 1877 and during extreme high water, when the larger part of the island would be submerged, the current would shoot the water directly over; hence there would be no cutting in the ordinary channel of this stream. Wherever there is a projection of the bank or an obstruction to the current it cuts. It will strike the obstruction and cut it away, and when past strike the next obstruction; hence it might create different angles by this cutting and striking at various points, at different parts of the bend, all the way around, and the cutting would not be noticeable until the water got down below its banks. The time of cutting, of course, would vary with different seasons. Sometimes it would continue cutting rapidly for perhaps two months; other times for perhaps longer; but I think usually the cutting period would be about that. The cutting would begin immediately after the April rise. As soon as the rise began to fall, provided the rise had been bank full, then it would remain sta-
tionary until the June rise, when it would cut again; then
302 it would continue cutting until it would reach its ordinary level.

Q. Then it would be about, say, two to three months in the year that nearly all this cutting would take place—in the spring?

A. I should judge so; after the April rise began to recede until the June rise. It would be perhaps a month cut between the April and June rise. After the June rise there might be another month of cutting.

Q. Mr. Keys, how much of this area known as Cut-Off island was formed during the period you knew it from 1870 to 1877?

A. I cannot say how much.

Q. Give your best statement.

A. I am somewhat familiar with the north part of this island, and we used to cross the river right at the mouth of this present lake. I used to go hunting across the river about at Grace street, in Omaha, and cross over from this neck and tie my boat there and take the

whole day and hunt right along the river. There used to be sloughs where the land was formed. This northern part formed during the time I mentioned, most of it, but I could not say just how much of it—about ¾ of a mile in width, and extending east and west
303 across the island. In 1871 was about the first time I was in sections 1 and 2. I should think fully three-fourths of a mile of the island had been added since 1872 on the north side.

Q. Now, as the land would be dropping off on the Iowa side what would be happening on the other side?

A. The land would be falling off on one side as soon as the river was below the level of its banks. Of course what would be going on on the other side would be unknown unless you were riding over the very site and sounding, which I used to do more or less of, and, as near as I could judge, it would be falling in.

Q. Then you could see large areas of land that had been formed while the waters were up?

A. Yes, sir, were the changes were sudden and noticeable. In other words, the channel did not appear to be any wider than before.

Q. And that it had broken off responsively on one side?

A. Yes, sir.

Q. Are you familiar with that point of the island down nearest where the river cut across in 1877?

A. Yes, sir.

Q. Did you observe the progress of the formation of that part of the land during the year it was being made?

304 A. There was no land formed on the island during that time that I recollect. What cutting was going on, according to my recollection, was on the east portion of the shore going north; it was cutting in but not adding to at that point. At the foot of Grace street there was a lone cotton-wood tree; at that cotton-wood tree the land was very firm and withstood the action of the current all the while. I doubt if there was any change from the original survey.

Q. Where is that point?

A. That is over nearly at the foot of Grace street, in Omaha.

Q. It is in East Omaha, is it?

A. Yes, sir.

Cross-examination.

By Mr. GREEN:

Q. You first knew the river in 1870?

A. In 1869 I first knew the river at this point.

Q. The process of adding to the East Omaha lands in what is designated on this map as sections 21 and 22 is still going on?

A. It may be; it seems to be at present.

Q. It is cutting here, is it not (indicating on map)?

A. Yes, sir.

Q. The river current strikes the Iowa shore here, does it not (indicating on map)?

305 A. I think so.

Q. The deposit is going on here?

A. It may be.

Q. In case of flood there might be more rapid deposits?

A. Unless there was a flood.

Q. If there should be a flood and cut here, there would be more rapid deposits here (indicating on map)?

A. Yes, sir.

Q. But the deposit is going on the same as for the last several years?

A. At points it is hardly discernible.

Q. Has there not been quite an area formed on the Omaha side since the cut-off?

A. No, sir.

Q. The same process, I mean.

A. No; I would not think so. From what I have observed of the formation of the land there has been more or less detraction.

Q. But the process is the same?

A. Yes, sir; the sediment comes from above and settles.

Q. And the current has been for years slack on the Nebraska side of the present river, has it not?

A. Yes, sir.

Q. And the cutting has been on the Iowa side?

A. Yes, sir; at that point.

306 Q. When did you first go up around Cut-Off lake, what year?

A. I think about 1871 or 1872.

Q. And how often did you go up there?

A. A number of times every season.

Q. This land was all covered in those days with a heavy growth of willows?

A. The north end of the island, as I recollect it, was a large bar extending to the river, and the following season I would notice that the bar extended.

Q. A man in order to run a line to survey would have to blaze his way?

A. Well, he might.

Q. Generally speaking, a man could not get a general idea of what was being formed from year to year, could he?

A. No; he could form a pretty correct opinion by the time he had come around entirely when he found he had gone a mile or more further in getting around than he used to.

Q. Then you measure by the time it took you to get around?

A. Yes, sir.

Q. So when you walked around in 1870 or '71 it did not consume so much time as when you went around the next year. You judged by the time it took?

A. Yes, sir; and the fatigue.

307 Q. How fatigued did you get when you traveled a mile?

A. It depends on how tired I was when I started.

G. H. KEYES.

CONRAD RACER, being duly sworn by the commissioner, testified as follows:

Direct examination by Mr. STONE:

Q. Where do you live?

A. In Council Bluffs.

Q. How long have you lived here in this vicinity?

A. I came here in the spring of 1857; arrived here between Omaha and Council Bluffs in April, 1857.

Q. Do you know Cut-Off island?

A. Well, I know about the place you call that island; I never have been over there.

Q. Were you near where Cut-Off island now is in 1875 or '76?

A. I don't believe I have been nearer there in 1857, '58, '59 than I could go there now.

Q. Were you there during 1875 and 1876?

A. I have been up and down the river there—what you call Bullen island down to what you call Lake Manawa.

Q. Did you ever work a saw-mill up there?

308 A. I didn't; I worked for a man that did have a saw-mill.

Q. Did you know anything about some timber that fell in the river?

A. I did; Dyball's timber.

Q. When did that fall in?

A. It was between 1860 and 1870.

Q. Was there much of it?

A. I think there was a big lot of timber.

Q. How many acres?

A. I was told it was 300 acres.

Q. Do you — anything about how much fell in from 1870 to 1877?

A. No; I do not.

Q. Were you along the river during that time?

A. Not so often as I had been before. In 1857, '58, '59, '60 I lived in the bottom, opposite what you call Florence. I worked for a man who had a saw-mill; then I came down most every day.

Q. Do you know anything about the warehouse that used to be up there?

A. No; there was no warehouse. I know about a great big warehouse about four miles from here. It was three-fourths of a mile from the river, and in two years the river crept in and had hauled the bank away to the middle of the warehouse.

Objected to by counsel for plaintiff as immaterial and irrelevant.

309 Q. That warehouse was three-fourths of a mile from the river, and two years after that it had to be moved out of the water?

A. Yes; they had to hitch to it about every other day and move it.

Counsel for plaintiff objects.

Q. A strip of how many feet wide fell in there in two years?
A. There was no one but myself and a clerk there. I started to go away and the clerk called me to come and look, and the whole land was fallen in. Nothing was left but foam and bubbles.
Q. What about the St. Joe railroad having to move their track that year?

Objected to as immaterial and irrelevant.

A. Well, I have seen that railroad track moved several times.
Q. That was a road that run up and down the Missouri river from Council Bluffs to St. Joe?
A. It was a straight line from Main street, used now as a wagon road, changed from the railroad track.
Q. Was that the same kind of dirt and soil down there that was up here at Cut-Off island?
A. About the same. This time of year, I think, the bank was 15 to 20 feet high—more quicksand than anything else.
Q. When the land would be falling away on this side what
310 would be happening on the opposite side?
A. When the river would fall in on this side it pushed the sand right over to the other side.
Q. It got over there some way, did it?
A. Yes, sir.
Q. The river channel after the water would go down would be about the same width it was before?
A. Yes, sir.

Cross-examination.

By Mr. GREEN:

Q. These circumstances which you relate occurred away back in 1857—about the big warehouse going in?
A. No; it was in 1863.
Q. And the little warehouse went in what year?
A. It didn't go in; we hauled it away.
Q. And the St. Joe track, when was that?
A. I could not tell.
Q. And these houses would be down this way (indicating); where were they located?
A. They were six miles by land from the steamboat landing; 15 miles by water.
Q. Six miles from Omaha?
A. Yes, sir.
Q. Now, you say when the river cuts off the sand on one shore it pushes it over to the other shore?
311 A. It can't do other ways.
Q. The same sand?
A. It is all sand and all mud.
Q. What becomes of the sand? Is it carried over, is it pushed over, or which?

A. Yes, sir.

CONRAD RACER.

Witness-:
T. C. DAWSON.
JOHN R. WEBSTER.

MARTIN HUGHES, being first duly sworn by the commissioner, testified as follows:

Direct examination by Mr. MCPHERSON:

Q. How old are you?
A. 55 years.
Q. How long have you lived in Council Bluffs?
A. 35 years.
Q. Are you familiar with this territory of land involved in this suit, generally referred to by witnesses as Cut-Off island?
A. Yes, sir; some.
Q. When did you first become familiar with this section of the country?
A. 35 years ago.
Q. Have you known it continuously from that time until the present?
312 A. Nearly so; yes.
Q. Have you known the Missouri river for 5 or 6 miles on each side both up and down from Cut-Off island?
A. Yes, sir; I have some land on that river.
Q. Did you ever work for yourself or any one on the Iowa side?
A. Yes, sir.
Q. When?
A. In the winter of '57 and '58.
Q. In what work?
A. Sawing wood.
Q. For whom?
A. For the ferry company.
Q. Now, you may state what year the Iowa side cut off most.
A. Well, I think it was in 1866 and '7.
Q. It cut off more from '66 to '68 than it did prior to that time?
A. Yes, sir.
Q. When it was cutting off on the Iowa side what would take place on the other side of the Missouri river?
A. After the water would go down we would see a great sand bar on the other side.
Q. When the water would go back to its usual stage how would it compare in width?
A. About the same.
313 Q. Would the difference be noticeable in any way?
A. No; I think not.
Q. Now, how much would you see cut off at one time on the Iowa side?
A. Probably 40 or 50 feet wide by 100 ft. long.
Q. How would it cut off—in parallel strips or pockets?

A. In strips.
Q. Did you ever see pockets cut off?
A. Yes, sir.
Q. How long would it be before the water would go down and you would see this rebuilding on the other side?
A. Directly after the water would go down to low-water mark.
Q. How long would the water be in going down?
A. About 3 or 4 weeks.
Q. That would be cut on the Iowa side during the whole year or in the space of a few weeks?
A. It would occur in a few months.
Q. What months?
A. In April, May, and June.
Q. Would there be much cutting during the balance of the year?
A. No, sir.
Q. Would there be any rebuilding on the other side except during those months?
A. No, sir.
314 Q. You say most of this cutting on the Iowa side and the rebuilding on the other side occurred from 1866 to '67?
A. Yes, sir; I had some land and——
Q. Can you locate the land you owned then?
A. Yes, sir; it was where Lake Manawa is now.
Q. How much of that land went in there in one season?
A. About 40 acres.
Q. In one season?
A. Yes, sir.
Q. In what year?
A. In 1867.
Q. Did the entire 40 acres go in?
A. Yes, sir; and I had a house on it.
Q. Did the house go in?
A. No, sir; I pulled it down before it went in.
Q. Going up to the land involved in this suit at Cut-Off island, how much of timber land did you ever see go in in one season?
A. I wasn't there at that time.
Q. How much land did you ever see go in in any one season?
A. I have no idea.
Q. Would it be such an amount in quantity as would be noticeable at first sight?
A. Yes, sir.
315 Q. Then when the river would go down would the *the* rebuilding be noticeable at first sight?
A. Yes, sir.
Q. Did you see the great cut-off on July 8th, 1877? Did you witness that?
A. No.
Q. How long prior to July 8th did you see that place where it had cut through?

A. I don't remember keeping track of those things in the way of cutting. I was keeping track of mine down below.

Q. Are these changes that you talk about—have they been occurring up and down the Missouri river for 20 or 30 miles?

A. Yes, sir.

Q. Do you know how many miles back the K. C. & St. Jo. road was compelled to move between Council Bluffs and Pacific Junction?

A. I don't remember noticing, exactly; about two miles, I think.

Q. Why did they set it back?

A. Because the land kept falling in and they kept moving it back.

Q. How many times in the last 20 years has that railroad been compelled to move back from the river between Council Bluffs and 15 miles south?

A. I don't know; 6 or 7 times.

Cross-examination.

By Mr. GREEN:

316 Q. Your lands were located in the neighborhood of Lake Manawa. How far was Lake Manawa in those days by river from the land in controversy?

A. 10 or 12 miles by river.

Q. You were up there one time cutting wood for the ferry company?

A. Yes, sir.

Q. You were upon this land, on section 23, were you not?

A. Down as far as the U. P. bridge.

Q. You were cutting timber along the Missouri river on the lands of the ferry company, probably in section 20 or 21, and you saw the river cutting into the Iowa side?

A. I saw it some; not much in those days.

Q. You cut wood, then, in the winters of 1857, '58, '59, & 60?

A. Yes, sir.

Q. Was that the only time?

A. That I cut there.

Q. All you know about the river's cutting and falling was what you observed in the winters of those years?

A. No, sir; afterwards I walked up around there.

Q. How many times?

A. I don't know how many times.

Q. But the extent of the cutting you cannot describe?

317 A. No, sir.

Q. Or in what pieces the bank went into the river you don't pretend to say, but you do know it was cutting some into the Iowa shore?

A. Yes, sir; I saw it dropping over.

Q. And you also noticed the building of land on the opposite side?

A. Yes, sir.

Q. Now, you never saw the actual rebuilding; you simply saw the results?

A. Yes, sir.

Q. When you saw the land it was already rebuilt, wasn't it?

A. Yes, sir.

Q. The building was done by deposits carried by the river—little particles of sand that looked thick and muddy, and let it stand awhile it would settle and form a deposit in a glass. Is that it?

A. Yes, sir.

Q. Now, it is by this process that these sand bars are created, is it not?

A. I suppose so.

Q. You don't see that process, but after it has gone on for some time you see the land has been built there, and that is what you identify?

A. Yes, sir.

Q. Lake Manawa is a sort of an elbow—a bend or curve?

318 A. Yes, sir.

Q. Down in that locality there were two or three channels, were there not, outside of the main channel?

A. Yes, sir.

Q. The river would overflow and perhaps flow through some of those other channels—false channels, you might call them—sometimes the main channel would flop over into one of those channels, wouldn't it?

A. I suppose so.

Q. The conditions of the river are not the same up here, are they?

A. I don't see much difference.

Q. I mean the shape of it. You would hardly mistake a map of the shape of that portion of the river for a map up above, would you?

A. I don't think so.

Q. Now, where did the river run (referring to Exhibit B 2) when you came into the State?

A. I cannot tell on this map.

Q. Can you tell where it run in any year by this map?

A. No; I cannot tell it.

Q. Was there a time when the river run right through Lake Manawa?

A. Yes, sir.

Q. And finally came a time when it cut through and run where it does now?

319 A. Yes, sir.

Q. And the wiping out of land occurred by the cut-off and not by abrasion?

A. Yes, sir.

Mr. McPherson:

Q. Do you mean to say you didn't see the river every year at or near Cut-Off island after '61 or '62?

A. No; I didn't say that; I wasn't cutting there after that, but I have seen it every year.

MARTIN HUGHES.

SEPTEMBER 30TH, 1891—10 o'clock a. m.

P. SHARTON, being duly sworn by the commissioner, testified as follows:

Direct examination by Mr. STONE:

Q. What is your name?
A. P. Sharton.
Q. What is your business, Mr. Sharton?
A. I follow railroading for a living—road-master of the K. C. division for the last eleven years.
Q. Where is your residence?
A. Council Bluffs.
Q. Are you familiar with the Missouri river at Council Bluffs and for some miles south?
320 A. At Council Bluffs I am not, but some miles south I am.
Q. You say you are road-master of the K. C. road?
A. Yes, sir; division road-master.
Q. What, if anything, do you know about the changes made in the river in the last few years?
A. They have been great.
Q. Describe them as well as you can.
A. Down at Manawa was the first that ever bothered us; we moved out about five miles from where it was first located.
Q. Kept moving it back from the river?
A. Yes; we had to move it three or four times.
Q. During the last ten or twelve years?
A. Since 1877; that was the first move. Then in 1864 nine miles south of here, down by the old station; in three months in 1884 there we had to move the track three times.
Q. How wide a strip was washed away there in three months?
A. Well, the track right north and south here and the river run the same way; it never had cut until the 10th of July it cut about 1,900 feet; then we moved it back and it cut out; then we moved it 500 feet.
Q. It cut out about 2,500 feet in three months?
321 A. About 2,500 feet.
Q. How long a strip did it cut?
A. Where it commenced it extended about one and one-half miles. It commenced to cut first; then it cut more in this one place than any one else.
Q. As that was cutting what was going on on the opposite side of the river?
A. It was forming a bar on the opposite side.
Q. What is true as to the average width of the river being about the same after as it was before?
A. It is very near the average width; of course, not in all places;

but some places the river forms an island in the center; but take it along the banks it is about the same width.

Cross-examination.

By Mr. GREEN:

Q. The cutting commenced in 1877, after the cut-off above, in the neighborhood of what they call Cut-Off island?

A. I don't know what time that did cut off.

Q. That occurred in 1877, and this other continued along since?

A. Yes; it continued until we moved the track away. We moved it away seven years ago altogether.

322 Q. It cut by making a bend in the Iowa shore?

A. Yes, sir.

Q. By deposits?

A. Yes; by the deposits from the bank, I suppose, as it came in.

Q. How far is Lake Manawa by river from the land in controversy?

A. I don't know, I am sure.

Q. Ten or twelve miles?

A. I don't think so; I could not tell.

Q. It is quite a distance, is it not?

A. It is quite a little distance; it may be seven miles for all I know.

Q. You don't know anything about what occurred up there in the neighborhood of the island?

A. No, sir.

All of this testimony is objected to on account of being irrelevant and immaterial by counsel for plaintiff.

Mr. LEWIS HAMMER, being duly sworn by the commissioner, testified as follows:

Direct examination by Mr. STONE:

Q. Where do you reside, Mr. Hammer?

A. In Council Bluffs.

Q. How long?

A. Since 1857.

323 Q. Are you familiar with the country along about Cut-Off island?

A. Somewhat.

Q. Are you acquainted with the changes that have occurred in the river during the last twenty years in that neighborhood?

A. Only in part. I know of some changes that have been going on.

Q. Where?

A. Near this point in controversy.

Q. What direction from it?

A. North. It would include Cut-Off island and from there north to a point in Harrison county.

Q. When did you observe those changes?
A. Probably from the year 1865.
Q. Describe them, will you, please?

Counsel for plaintiff objects to any testimony in relation to changes occurring above the point in controversy for the reason that it is irrelevant and immaterial.

A. At this one point furthest up in Harrison county—all I know I know that the river had been caving the banks.
Mr. GREEN: How far north?
A. I should judge on a straight line from that point would be about twenty miles.
Q. How far by the river?
A. At least twice that distance—forty miles.

Same objection again made.

324 Mr. STONE:

Q. Describe the observations you saw.
A. It was the same as has been testified. The river was cutting out banks during high water.
Q. During what portion of the season would most of the changes occur?
A. During the month of April up to the first or middle of July.
Q. How much of a change have you known to occur in any one season?
A. At that point there was at least a width of forty acres taken in.
Q. How long a distance?
A. Well, I should say a mile.
Q. As that was going on upon one side what was happening upon the other?
A. Well, there was a deposit of sand and *and* soil—mostly sand—formed on the opposite side.
Q. After the subsidence of the flood and going down of the water what was the average width of the river as compared before the flood?
A. I could not see any difference in the width.
Q. These smaller sections on the map indicate 40-acre subdivisions?
A. Yes, sir.

LEWIS HAMMER.

325 We, Howard B. Smith and Thomas C. Dawson, examiners and commissioners duly appointed by the Supreme Court of the United States to take the evidence in this cause, do hereby certify that on August 10, 1891, and on divers days subsequent thereto and prior to September 30, 1891, we were attended at the office of Greene & Baxter, in the city of Omaha, Nebraska, and in the office of Jno. Y. Stone, in the city of Council Bluffs, Iowa, by the counsel and witnesses aforesaid; that the said witnesses were duly sworn and examined and their depositions reduced to writing; that the deposition and evidence of each witness respectively, excepting that of

Jno. P. McPherson, on the part of the State of Nebraska, and of P. Sharton, on the part of the State of Iowa, was by one of us read over to him and by him subscribed in the presence of one of us and at the time duly subscribed and sworn to before one of us; that Exhibits A, B, C, D, & I were introduced on the part of the plaintiff, The State of Nebraska, and Exhibits A, B, B 2, B 3, & C on the part of the defendant, The State of Iowa; that by agreement of the parties a lithograph copy of "Exhibit I" was substituted for said "Exhibit I."

We further certify that Chas. B. Rustin, John A. Smiley,
326 George Smith, J. A. Swobe, W. W. Marsh, Thomas Tostevin, Jno. P. McPherson, Alfred D. Jones, Henry Homan, Eugene L. Ware, C. F. Potter, and Theodore Miller were subpœnaed on the part of the plaintiff, The State of Nebraska, and that each of them, except Jno. P. McPherson, was in attendance four days and traveled two miles, and said Jno. P. McPherson was in attendance five days and traveled 96 miles; that said witnesses were subpœnaed by Theodore Miller, especially appointed by the commissioners in this behalf, and that he traveled 162 miles in summoning said witnesses; that H. H. Field, R. V. Phillips, Lewis Hammer, George Graves, Fenton Harl, M. S. Clausen, J. E. Rudd, Jno. Coyle, Jno. Dohaney, Conrad Racer, Martin Hughes, Frank Guittar, Jno. Hammer, E. Thornton, Thomas Tostevin, Thomas Smith, Pat. Sharton, C. J. Rudd, G. H. Keyes, and Samuel Jacobs were subpœnaed as witnesses on behalf of the defendant, The State of Iowa; that each of said witnesses was in attendance four days and traveled two miles; that said witnesses were subpœnaed by Jno. L. Templeton, marshal of the city of Council Bluffs, Iowa, specially appointed in this behalf by said commissioners; that he traveled 120 miles
327 in serving said subpœnaes; that the commissioner was in attendance and necessarily occupied in this matter forty-two days.

HOWARD B. SMITH,
THOMAS C. DAWSON,
Commissioners.

Dated at Council Bluffs, Iowa, September 30, 1891.

(Endorsed:) Supreme Court U. S. 1891, October term. No. 4. Original. The State of Nebraska, complainant, *v.* The State of Iowa. Testimony taken on behalf of both parties. Office Supreme Court U. S. Filed Dec. 21, 1891. James H. McKenney, clerk.

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CLERK.

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1891.

NO. 4, ORIGINAL.

THE STATE OF NEBRASKA, *Complainant*,

vs.

THE STATE OF IOWA.

BRIEF FOR COMPLAINANT.

J. M. WOOLWORTH,
C. J. GREENE,
Of Counsel.

G. H. HASTINGS,
Attorney General of Nebraska.

REES PRINTING CO., OMAHA.

SUPREME COURT OF THE UNITED STATES.

THE STATE OF NEBRASKA, COMPLAINANT,

vs.

THE STATE OF IOWA.

BRIEF FOR COMPLAINANT.

This is a bill in equity exhibited in this Court for the purpose of ascertaining, declaring, and establishing the boundary between the States of Nebraska and Iowa.

Iowa was admitted into the Union in 1846, with boundaries described in the Act of Congress passed for that purpose, and in the Constitution of the State, which are particularly set out in the first paragraph of the bill. It is sufficient for the purpose of this inquiry to state that the western boundary was described as beginning at the point where the north boundary of the State of Missouri intersects the main channel of the Missouri River, "thence up the middle of the main channel of the said Missouri River, to a point opposite the middle of the main channel of the Big Sioux River, according to Nicolett's map."

In 1867 Nebraska was admitted into the Union, with boundaries established by the Act of Congress in that behalf,

and the Constitution of the State, which are described at length in the third paragraph of the bill. Its eastern boundary is described from the Niobrara River at its junction with the Missouri River in these words: "Thence down the middle of the channel of said Missouri River and following the meanderings thereof to the place of beginning."

In consequence of changes in the channel of the river, the causes, nature and extent of which will be more fully set forth hereafter, give rise to the controversy. For the purpose of defining the banks of the river at or about the times when the two States were admitted into the Union, the meander lines on the two sides of the river as established by the United States surveyors are set forth in the bill. It appears from the pleadings and proofs that in 1851 the United States, by its surveyors, ran, marked and made field notes and plats of the meander line of the east or left or Iowa bank of the river, which plats and field notes were duly returned to the Surveyor General for that State, who filed the same in the General Land Office, where they were duly approved. The meander line as thus run by the surveyors, and as the same appears in the field notes of the survey, are set forth in the second paragraph of the bill. In the first paragraph of the answer, this line is again described; and it is said that the description in some minor particulars in the bill, is inaccurate; the corrections sought to be made, however, are not material.

In 1856 the United States by its surveyors ran, marked and made field notes and plats of the meander line of the west right or Nebraska bank of the river, which plats and field notes were duly returned to the Surveyor General for that State, who filed the same in the general land office where they were duly approved. In the fourth paragraph of the bill, this

line is described as in the field notes and plats. The Court will readily trace these two meander lines upon the condensed maps marked Exhibit "I" and presented with the briefs. The bill alleges that in 1851 the course, current, bed and main channel of the river began to change at several places between the termini of the two meander lines before mentioned, and traces those changes down to 1877. It may be said that in the general course of the river which is the subject of the present inquiry, there were two bends; one "Busha's bend," in sections 22 and 21 in Iowa, and "Saratoga bend," in sections 1, 2, 3, and 10, in Nebraska; the latter being below the former in the course of the stream and north of it. The location of these bends is given by the witness, McPherson, at page 75 of the record.

About the time of the admission of Iowa into the Union, with the boundary described above, the river ran east and west near the north line of sections 22 and 21, along and strongly against the left or south bank of the river. It cut into this bank, continuing to do so until 1877, at which time this bank passed through the southern parts of those sections. While these changes were taking place, the current of the river struck against the right or north bank thereof in sections 1 and 2, in Nebraska, and cut the ground out at that place, until in 1877 that bank of the river was in the north part of those sections. At this place the general course of the river was nearly east and west and it curved to the south in the east part of section 3, in Nebraska. At the same time, like changes were taking place in sections 20 in Iowa, and 3 and 10 in Nebraska, the river cutting first into the Nebraska shore, then into the Iowa shore. In 1877. the river, after passing down the stream around the "Saratoga bend" came to a point opposite that at the foot of "Busha's bend" where it turned north and sud-

denly broke through the intervening space; the whole body of water afterwards flowed from that point southwesterly on its course, leaving its former bed from the foot of "Busha's bend" around the "Saratoga bend" to the point of the cut-off without a current, and with little water which has since dried over most of the surface. From the point of the cut-off, the current struck across the bed of the river against the Nebraska shore, by which it was turned south, subsequently making some changes below that point. These changes however, are not within the present controversy.

The contention of the complainant is that these changes which took place between 1851 and 1877, were gradual; and that, therefore, the boundary between the two states followed the changes in the main channel of the river; throwing into Nebraska what was formerly sections 21 and 22 in Iowa, and what was a part of sections 1, 2 and 3 in Nebraska, into Iowa, and that the boundary thus changed was unaffected by the sudden action of the river in 1877. The defendant, on the other hand, contends that the changes which took place were not gradual or imperceptible, but so rapid and extensive as not to affect the boundary of Iowa, when it was admitted into the Union. It therefore claims the territory and jurisdiction accordingly.

In the sixth paragraph of the bill the complainant states, particularly, the boundary upon which it insists and which it seeks to have established. It proceeds further to state that from 1877 until about three years last past, the lands described above were wild, uncultivated and of little value, and did not attract public attention; that within the past three years, the inhabitants of the State of Nebraska have entered upon the said lands and begun to make large and valuable improvements thereon, claiming title thereto on the ground that the

same were accretions to the lands of which they held the legal title, derived to them from the government; that about two years ago the authorities of the State of Iowa put forward the claim that these lands were within its boundaries, sovereignty and jurisdiction; and they have established and maintained a large, active and vigorous system of police and levy upon these lands, taxes for the support of their municipal and State governments; that many evil disposed persons have settled upon these lands, and on account of doubts excited by disputes as to the boundary between the two States, have set at defiance the laws and authority of both, so that when the officers of the State of Iowa undertake to enforce its laws against said persons, they insist that they are within the jurisdiction and sovereignty of the State of Nebraska; and on the other hand, when the officers of the State of Nebraska undertake to enforce its laws against these persons, they insist that they are within the jurisdiction and sovereignty of the State of Iowa. So that a state of lawlessness and violence exists in that region. These lands are adjacent to the City of Omaha, and various industries are being established and built thereon, over which each State claims jurisdiction.

In the fourteenth paragraph of the answer, the defendant has set forth what it claims was the true course of the river in 1877, immediately prior to the cut-off, giving the right and the left bank thereof. The State of Iowa has also filed a cross-bill alleging, substantially, the same facts which it insists upon in its answer and praying relief accordingly. To this cross-bill there is an answer, on the part of Nebraska, insisting upon the case made by it in its original bill.

The case made in the proofs is the following: The Missouri river is at most places in its course, from twenty-five hundred to three thousand feet wide, and in its channel from

ten to fifty feet deep, and its current is from five to ten miles an hour. It flows through a region of low land from three to five miles wide. The soil is all, or nearly all, alluvion; which, in the region subject to inquiry here, is from seventy to a hundred feet deep to rock. The subsoil is a heavy and coarse sand, above which is quicksand: the surface is a layer of adhesive material composed of roots of trees, weeds, grass and decayed vegetable matter, which forms a crust of more or less consistency, varying in thickness from a few inches to several feet. There are also in many places deposits of "gumbo," a heavy stiff clay, which are generally the beds of extinct lakes. The immediate banks of the river generally differ at opposite points. On one side, the bank rises perpendicularly above the flowing water, and at ordinary stages about eight or ten feet; along or against this bank the channel runs sometimes with great velocity and depth. The opposite bank is low, generally a mere sandbar, which in high stages, is covered with slack water which deposits silt, as the river falls this appears above the water as a bar or low soft body of earth. Going from the river over this formation we come to the first bench which is also low and is above the water except in floods. In a former season it was a bar as above described and has gained in heighth and consistency. Beyond this is the second bench which is higher than the first, and beyond that a third, which is higher than the second. Each is sharply defined and easily seen from the river.

When the channel runs straight or nearly so for a considerable distance, the banks as above described maintain their form. Any object, such as a snag, becoming fixed in the bed gathers debris upon which sand collects more and more, until a bar is formed, which grows into an island unless swept out by high water, or otherwise, which often hap-

pens. The current may flow on each side, or it may follow the higher bank, leaving slack water on the other side. Instead of flowing in a straight course, the channel generally runs strongly against one of the banks; if against the low one, it cuts out the bar and one or all of the three benches; if against the higher, which more generally happens, it cuts out the quicksand and thus undermines the crust which falls into the water, sometimes in small, sometimes in large pieces. The distance thus undermined before the surface falls in, depends on the nature of the soil; if it is strong and deep, the process may go on for a considerable distance; so, too, if there are trees or stumps whose roots support the soil; in either case the surface cracks sometimes fifty feet back from the water and the intermediate ground settles into the river where it dissolves and is carried in suspension in the water or rolls in large pieces along the bed. On the other hand, if the crust is not deep or of much consistency, it falls when only one or two feet are undermined.

Twice every year the river rises, often overflownig its banks; one known as the "spring rise" takes place generally in March or April, and is caused by melting of the ice and snow upon and along the river; the other is known as the "June rise," and takes its name from the month in which it generally occurs, and is caused by the melting of snow in the mountains. Two, three or four times since men have lived along the river, there have been great floods overflowing not only both banks, but the whole region on either side. When the water fills or overflows the banks the earth becomes saturated and soft; and when it recedes, the current at that time strong, easily cuts out the sand; and the surface falls in rapidly. When its volume is large and its course violent, and it meets a strong bank, it cuts a great depth into the bed and whirlpools of great force

are sometimes formed. One witness tells us that once he saw a tree sixty feet high, gradually sink underneath the water in its upright posture. This can be explained only, by supposing that the current had worked out a deep cavity in the bed of the river and that the roots held a great mass of earth which maintained the tree erect. The process of undermining is unseen. Although it is greatest in the few weeks succeeding the floods, it is going on during almost the whole year.

The current which has set strongly against the bank and carried away a large quantity of earth, after a time meets some sufficient resistance, which may be presented by a bank of unusual strength or by trees or roots, and is turned by it and shoots across the river an angle more or less sharp; some times it turns almost on itself and runs in a direction nearly the reverse of that in which it flowed. If it takes an oblique course, it strikes against the opposite bank with the same effect as before. Or if it make a sharp bend it works out for itself a wide circuit much in the shape of a horse shoe. Turning thus from bank to bank and winding through these low soft lands, the river has a serpentine course, constantly undergoing great and sometimes rapid changes.

We have so far directed attention to the process of these transformations. But this does not completely describe the methods in which they are worked out. The water in the river must from the nature of the case, be very muddy; when violently agitated and the current sets strongly against a bank it carries a large quantity of sand and other matter in suspension; when the water is still, or slack this matter quickly settles. The matter which falls into the river is not carried across the current; not only are we told this by one witness, but it is easy to see that it must be so. On the other hand, it is swept along in the channel and its lodgment cannot be fore-

seen or discovered. The strong current and large volume flowing around a bend necessarily leaves slack and shallow water on the opposite side. The process of settling thus goes on; the silt forming a soft body underneath the water and not in sight. At last when the water falls still more, the sand-bar appears: this becomes more and more solid; each succeeding rise deposits a new layer; soon grass, weeds, willows and cottonwoods spring up; these more and more impede the current at the subsequent floods so that larger deposits are made. And strong winds prevalent in these regions, blow large bodies of sand which the undergrowth gather, and which form land sometimes even higher than the second or even the third bench. Of course when the deposit of silt begins, this process of formation is not visible because it is under the water; but one skilled in the matter knows what is going on. It may be stated as a law that when the water is quiet, this action is going on. When the river falls what has been taking place out of sight, comes quckly into view. Thereafter the building up of the land is particle by particle and by imperceptible degrees.

This is a fair statement of the result of the testimony touching the general character and habits of the river. Within this description is all that part of it from the point at which in 1877, it turned north, northeast through Saratoga bend. There is no evidence to the contrary: all the changes in this reach of the river were gradual and imperceptible. The testimony to show a different process in the changes in the river, is confined to the river in sections 22 and 21. The meander of the Iowa or left bank was run in 1851. It ran east and west near the north line of 21 and 22. The Nebraska or right shore meander was run in 1856. This line met the former at or near the middle north and south line of

the latter section. This shows that during these five years, the river had changed its bed to the south, the distance of its whole width. These changes continued in the same direction until in 1877 the river in Busha's bend at that time had the right bank near the northeast corner of the section through the center of the section to the southwest corner and thence through the southeast quarter of 21: the left bank being of course the width of the river south thereof. The question is, were these changes gradual and within the fair meaning of the term imperceptible, so as to admit the application of the same rule to them as we shall show governs those in the Saratoga bend.

In 1877 the river ran southwesterly through the southeast quarter of section 21 and was cutting west: at that point it turned to the northeast and flowed through Saratoga bend. In section 3 in Nebraska, it again turned south, ran against first the shore on that side and striking across next the Iowa shore and flowed through the southwest corner of section 21 on that side. Its bed formed a horseshoe; the foot of Busha's bend and the foot of Saratoga bend being near together: the distance around was four or five miles, and that across less than half a mile. Suddenly the intermediate space was swept out and the whole body poured through. A new channel was thus formed, which left the bed from the point of contact around Saratoga bend to the same point without a current and the same has since become dry for the most of the distance. Nor did the changes stop here. The river has since continued to work and wear its course southeast and now crosses the north half of 27 and 28.

FIRST POINT.

The controversy between the parties being upon the character of the changes, that is to say, whether they were gradual

or sudden, the substance of the testimony on both sides upon this question will be given, in addition to the statement above of the result of the evidence in respect of the general character of the river.

The testimony of the witnesses will be presented in the order of time at which they respectively became acquainted with the river.

Alfred D. Jones, who first became acquainted with the river in 1851—was a surveyor; his testimony will be found on pages 91 and 92. In 1852, he ran a line from the quarter stake in 21, in Iowa, due east to Horseshoe Lake in section 23. The river at that time was just north of the lines between sections 21 and 22. He ran another line in 1853, and found the river cutting his former line. It cut around the west one-half of section 22, and the north one-half of section 22, and into sections 1 and 2 in Nebraska.

Mr. Tostevin, the witness who next became acquainted with the river, and whose testimony begins on page 69 of the record, being called for the complainant, says, that he came to Council Bluffs in April, 1854. At that time the river was working southwest, in sectoin 22 in Iowa, and during the three years after the meander line was run, it had moved south in that section 1300 or 1400 feet. It was cutting southward through that section. It ran from that point to near the dividing line between sections 2 and 3 in Nebraska, where it turned abruptly south. This cutting continued to 1877, and formed a horseshoe when the two channels met, leaving the old bed of 1870 as a bayou. When cutting on the Iowa side, it was forming land on the Nebraska side in proportion to the erosion, and where it was cutting away from Nebraska, it was building on the Iowa side by deposits formed by washing and depositing sand. In 1867 the river had not commenced cut-

ting the south half of section 22. From 1867 until 1877, he paid no particular attention to this matter.

The cross-examination of this witness will be found on page 107 of the record, where he makes some statements as to the general character of the river. The same witness is called by the defendant, and his testimony begins on page 109. On cross-examination on page 114, he says that as a witness and civil engineer and surveyor who made a study of the river, his belief was that the river changed its course and direction as it ran in 1851 to this present course and direction, by abrasion and accretion, and not by any sudden changes or cut-offs.

The witness who next became acquainted with the river, was John Hammer, whose testimony begins on page 140. In 1855 he bought Busha's farm, about 200 acres of which was in section 22. This land was from 1863 to about five years ago in falling into the river. Where there is a bend in the river it washed more rapidly than elsewhere. He thinks that there has been as much as 30, 40 and 50 acres carried off in one year.

On cross-examination, he says that when he bought the farm from Busha in 1863, some of it had washed away; but not much, and it continued to wash until he sold it to Harl.

The current hugged the Iowa shore on the opposite side; it was still water and material was deposited and formed a bar by a slow and gradual process. The land in Cut-off Island was made by deposits of the water by forming sandbars and deposits.

Dr. George Smith, whose testimony begins on page 47, was a surveyor and engineer and became acquainted with the river at this point in April 1856. He says he made several surveys

of lands in this vicinity and was well acquainted with the river. In 1856 the river ran where the Nebraska meander line is shown. The changes in the river between 1856 and 1877 were affected by abrasion and accretion. Between 1851 and 1856, the abrasion had been such that Beyer's, who ran the Nebraska meander, crossed the Iowa meander. In making a survey in 1856, Smith found about eight rods of the bank had washed away from the line of the original survey. In sections 1, 2, 3 and 10 in Nebraska, the river was abraiding and cutting off the Nebraska shore and accumulations and accretions were forming opposite. The accumulations and abrasions differed in different years, wearing off on the current side, and filling on the opposite shore. But the whole character of the change may be called slow. There were no cut-offs nor any sudden change of the channel of the river outside its banks, the filling was by deposit and silt.

The witness who next became acquainted with the river at this point, was John T. McPherson, whose testimony begins on page 74. He became acquainted with the river in 1856, and after that time was engaged as pilot on the ferry boat running between Omaha and Council Bluffs. In that year the current in Busha's bend struck the Iowa shore; in the Saratoga bend it struck the Nebraska shore, wearing them slightly; heavy cutting began in 1862 or 1863. At times the river cut the Iowa shore in Busha's bend, perhaps 50 feet back. On the opposite shore, land was being formed on the Nebraska shore. As the river cut into sections 2 and 3 in Saratoga bend, the same thing was going on on the Iowa shore. His recollection extends from 1856 to 1880, and there was no cut-off in this locality during that time. After the cut-off the current struck the Nebraska bank opposite the cut-off and ran from there along the Nebraska shore, south.

The extreme changes in Busha's bend were in the sixties until the final cut-off. In this bend, the outer end would cut in the early part of the year, and as the water receded, it would extend to the lower end, and 25 or 50 or 75 feet of the bank would seemingly go in during one rise which would be a period of one, two or three weeks. Sometimes it seemed to be going in continuously; sometimes cut out one place, and take that, and then cut more in and take that.

Henry Homan, whose testimony begins on page 93, came to Omaha to live in 1856. His attention being called to sections 21 and 22 in Iowa, he says the river has been cutting in on this bank from year to year gradually making the bend much deeper; it was cutting in sections 1, 2, 3 and 10 in Nebraska. Opposite those sections land was being formed in Iowa. For the last twenty-five years in sections 21 and 22, the river has been constantly cutting from Iowa and building on Nebraska. Some years it worked in two or three hundred yards; and in one day the river would recede twenty or thirty feet.

Martin Hughes worked for the Ferry Company in 1857 and 1858. The river cut off on the Iowa side more from 1866 to 1868 than before. He has seen probably forty or fifty or one hundred feet cut off at one time; the cutting on the Iowa shore occurred in April, May and June and not much in other parts of the year.

John A. Smiley, whose testimony begins on page 35, became acquainted with the river in 1857. He pre-empted and owned lands in Nebraska near the river, from which he could overlook it, and his attention was particularly directed to the changes as they took place. He says that after he pre-empted land in sections 3 and 10 in Nebraska, the river was cutting

rapidly in 21 and 22 on the Iowa side, and gradually in section 1, more rapidly in section 2, and very gradually in 3 and 10 in Nebraska. The land was gradually cut out and gradually filled back in, by accretions from the river. The river kept its natural width and new land was formed opposite the cuts. From 1856 to 1877 there was no sudden change, the process was gradual and slow, each year cutting on one side and filling on the opposite side. The changes were not sudden and considerable, but slow, imperceptible and gradual. The change could be discovered if you would make a survey there, but if a man was riding horseback or driving a team, he would find you had lost several feet of ground. The changes were imperceptible without measurement. You might ride over it every week and you would not notice it was going, and you might drive a stake and go back in three months and take the measurement, and you would find you had lost 100 feet of ground. "I mean by imperceptible formation, you cannot see from day to day any change; but you can by actual measurement."

The testimony of Charles B. Rustin begins on page 30. He says that from 1864 until 1872 he was engaged in the ferry and transfer business on the Missouri River between Omaha and Council Bluffs, and has been pretty well acquainted with the character, habits and history of the river since that time. In 1864, in the vicinity of sections 20, 21 and 22 in Iowa, the channel of the shore was further west than the meander line of 1856. The bank had cut away at that time to a point in section 10 in Nebraska as shown on Exhibit B. As a consequence, the channel was further east; it cut in further east in sections 28 and 29. In section 22, the encroachments were on the Iowa shore from 1864 to 1877. In 1864, it was a little south of the center of the north one half of sec-

tion 22. The river kept cutting south down through 22, and rounding out on the Iowa shore.

After 1877, the old bed gradually filled up north of the point of the cut-off. These changes were gradual; encroachments on the outer periphery of the bend and gradual filling on the inside. There was a good strong wash in places, but the change was gradual. Land in sections 1 and 2 in Nebraska, and 21 in Iowa were formed in this way; the same is true north and west of the Nebraska meander line. They were formed by accretions to the Iowa shore.

W. W. Marsh, whose testimony begins on page 65, has been acquainted with the river in this vicinity since January, 1863, at which time he was engaged in the operation of the boat of the Nebraska Ferry Company, of which he was president. A gradual change took place in the channel of the river on both the Iowa and the Nebraska side. The river was as shown in Exhibit "B" in 1863, except it had dropped lower down in the northwest quarter of 22 in Iowa, taking out a portion of the land there, and more in the northwest direction in section 2 than is there repaid. It was gradual, cutting into section 22 in Iowa and in 2 and 3 in Nebraska. The channel on the Iowa side was in the north half of sections 21 and 22, and gradually every year it took a portion of that bank and dropped further south. The same was true on the Nebraska side in sections 2 and 3, but it did not cut so rapidly on the Nebraska side as on the Iowa side. Accretions were being formed opposite these cuts. The change was gradual, but not slow, and the new land formed by deposits of material.

Fenton Harl, whose testimony begins on page 117, says that he has been acquainted with the river, and has lived on the bank since the summer of 1865. In the summer of 1865, his father bought a piece of land of Mr. Hammer, who has

already testified. There was a brickyard upon it, and two houses. The river was about 100 feet north of the yard. The river commenced cutting in that spring and took in the crop and dragged down the house. We had to move our goods and kept hauling back the house, a short distance at a time. During that season, the river took off all of the tract of 150 acres but 15; in one night it took away 65 feet. Below this land there was other land also carried away by the water, and he judges that 200 or 300 acres were thus cut off. Land was at the same time making on the other side. The land of which he is speaking is in section 22.

M. S. Clausin, whose testimony begins on page 128, came to Omaha in 1865, and in the first part of that year, was rafting lumber down the river from Council Bluffs and Omaha. He says that he has seen pieces of land go in the river from 20 to 30 feet wide. A strip of 50 feet wide would crack off and settle there, and it would be perhaps several hours before it would fall off. It sometimes cut the land out so rapidly as to make it necessary to move houses. Land formed opposite the cuts corresponding in extent. The main channel of the river was right along the Iowa bank in the locality of section 22, and most of the lands formed opposite the cuts, was so formed by accretions. The river cut through the whole season, more or less; but more rapidly right after high water and continued from two weeks to a month, during which time at some points from 100 to 200 feet would be carried away, a couple of hundred feet would be carried away in one year; more in some years than in others. It cut more in 1866 and 1867 than in other years. At no time could he see the land forming. This was during high water; and when lower water came, he could see the bar that had been formed.

The testimony of John A. Swobe begins on page 55. He

has known the river since 1863; from that year to 1867, he hauled wood for the Ferry Company; and after the latter year to 1877, ran the ferry boat as captain. In 1863, the river was cutting into section 2, in Nebraska, and filling in opposite on the Iowa shore. And in section 22, in Iowa, it was cutting into Iowa and kept on doing so until 1877. As it cut into section 22, it filled on the Nebraska side. These changes were slow and gradual; no sudden cut occurred during this period. Nearly all of the 2,000 of acres of land were overrun by the river between September, 1863, and 1877. The ground fell in from March to August, depositing as rapidly on the Nebraska shore, as it washed away on the Iowa shore. When chunks of earth fell into the river they dissolved and the elements floated down as mud. You can go there every day and you would not see any change, but it was cutting away all the time. But you go away and return in two or three weeks and you would see quite a change. You might see a bank fall in, but not form on the opposite side; there was a slow and gradual process.

As we said in the statement, it will appear from this resume of the testimony that the change of the river in Saratoga bend, and from there down to the point where the cut-off took place in 1877, the land was formed gradually and by imperceptible degrees. Each witness who speaks upon the subject, holds the same language. And some of them say that the changes in this part of the river were not as rapid as those in Busha's bend.

We pass to consider the testimony which we have presented in respect of the changes in Busha's bend.

1. In 1851 the south bank of the river ran near the north line of sections 20, 21 and 22. This is shown by the meander

line run in that year. In 1877 that bank ran near, or a little below, the south line of 22, and of the east part of 21. The change covered a distance of about a mile. The time covered by this change was 26 years.

2. All of the witnesses agree that during this period there was no cut-off by which the change was caused. Some say it was gradual, slow and imperceptible; others that it was gradual and not slow; others that it was rapid. Disregarding these general descriptions of the progress of the changes, and considering the facts given by them, the case may be shortly and accurately stated thus: The current set strongly against the Iowa bank and ran forty or fifty feet deep. Just after the June rise, it undermined fifty feet or more, and the surface cracked and sunk into the water and was dissolved and carried away. In two, three or four weeks, the most of the land was carried away in this manner in any one year. The greatest changes were in 1866 and 1867. As much as 200 or 300 acres seem to have been cut away in a single season. It is evident that this was exceptional, for the extent is beyond an average of all the twenty-six years. As these cuts were making on the Iowa shore, new land at about the same rate was forming on the Nebraska shore. Two witnesses distinctly say that these additions were not visible at any moment of time. The rapidity of the changes was not such as to bring them within the description of erosion or avulsion; but they should be classed under the name of accretion or alluvion.

3. Even if the process of cutting the Iowa shore was by avulsion, that fact does not determine the nature of the change. Regard must rather be had to the formation of new land in Nebraska, which within every description was by accretion. Or if the cutting and filling should be both taken account of,

the change of the bed of the river was slow, gradual and imperceptible.

4. Nor should the changes of 1866 and 1867, which were the greatest, be considered by themselves; but rather what took place in the whole period of time from 1851 to 1877. The changes, even when greatest in any one year or in any season of one year, were not sudden as in the case of a cut-off. Aside from that fact, however, we are confronted by a matter of convenience. Where the river, its banks and currents were in 1856, we do not know, and no man can tell; where they were in 1867, is beyond our ability to determine. Such facts can be determined in the case of a sudden change by avulsion. It is to the utmost consequence that in so grave a case as the boundaries between sovereign States, involving jurisdiction as well as soil and territory, certainty should be reached. That can only be here by treating the changes in those years as gradual and imperceptible.

SECOND POINT.

This Court has laid down the rule governing avulsion and accretions in the Mississippi and Missouri Rivers, so far as the private rights are concerned. The case involving such rights to land formed by accretions in the Saratogo bend, has lately been considered and determined by this Court. The case was that of *Jefferies v. The East Omaha Land Company*, 134, U. S., 178. That was a demurrer to a bill in equity. The bill described the river very much as have the witnesses in this case. The substance of the allegations is given at the foot of page 189 by Mr. Justice Blatchford, speaking for the whole Court, in the following terms:

"It is contended by the defendant that this well settled

rule is not applicable to land which borders on the Missouri River, because of the peculiar character of that stream and of the soil through which it flows, the source of the river being tortuous, the current rapid, and the soil, a soft, sandy loam, not protected from the action of the water, either by rocks or the roots of trees; the effect being that the river cuts away its banks, sometimes in a large body, and makes for itself a new course, while the earth thus removed is almost simultaneously deposited elsewhere, and new land is formed almost as rapidly as the former bank was carried away. But it has been held by this Court, that the general law of accretion is applicable to land on the Mississippi River; and, that being so, although the changes on the Missouri River are greater and more rapid than on the Mississippi, the difference does not constitute such a difference in principle as to render inapplicable to the Missouri River the general rule of law."

He also says, "The rule is as applicable to the Missouri River as it is to the Mississippi, whether the principle on which it rests be that the riparian owner is entitled to the addition to his land because he must bear without compensation the loss of land caused by the action of the water, and any consequent expense of repair to the shore, or whether that principle be one of public policy, in that it is the interest of the community that all lands should have an owner, and most convenient that insensible additions to the shore should follow the title to the shore."

So that we may confidently say that although the changes of the river in Busha's bend were as rapid, as some of the witnesses state, by cutting away the banks sometimes in a large body and forming new land almost as rapidly on the opposite shore, yet the principle of accretions is fairly applicable.

Nothing would be gained by a review of the many cases determined in this Court in which the principle has been asserted.

It only remains to inquire whether the doctrine of accretions as applied to private parties is applicable to boundaries between sovereign States. We say that just as the proprietor of land on one side of a river loses it by the gradual abrasion thereof by the water, and the proprietor on the opposite side gains by accretions to his estate formed by the same forces, so one State may in one case lose and in the other gain in territory and jurisdiction. This is a question of public law, which has been settled from the earliest times.

THIRD POINT.

The rule of accretions and avulsions which this Court has applied to the lands of private parties has the same application to boundaries between states.

In Vol. viii, Opinions of Atttorneys General, p. 177, this subject received exhaustive consideration. A dispute arose between our government and Mexico in consequence of changes of the Rio Bravo. In his letter to the Secretary of the Interior, Attorney General Cushing said:

"The respective territories of the United States and of the Mexican Republic, are arcifinious; that is to say, territories separated not by a mathematical line, but by natural objects of indeterminate natural extension which of themselves serve to keep off the public enemy. Such are mountains and rivers. (Barbeyrac's Grotius, liv. ii, Chap. 3, s. 16 and note; Cocceii Grotius Illustratus, *ibid.*)

"When a river is the dividing limit of arcifinious territo-

ries, the natural changes to which itself is liable, or which its action may produce on the face of the country, give rise to various questions, according to the physical events which occur, and the previous relation of the river to the respective territories. The most simple of all the original conditions of the inquiry is where the river appertains by convention equally to both countries, their rights being on either side to the *filum aquae*, or middle of the channel of the stream. That is the present fact.

"With such conditions, whatever changes happen to either bank of the river by accretion on the one or degradation of the other, that is, by the gradual, and *as it were*, insensible accession or abstraction of mere particles, the river as it runs continues to be the boundary. One country, may in process of time, lose a little of its territory, and the other gain a little, but the territorial relations cannot be reversed by such imperceptible mutations in the course of the river. The general aspect of things remains unchanged. And the convenience of allowing the river to retain its previous function, notwithstanding such insensible changes in its course, or in either of its banks, outweighs the inconveniences, even to the injured party, involved in a detriment, which, happening gradually, is inappreciable in the successive moments of its progression.

"But, on the other hand, if, deserting its original bed, the river forces for itself a new channel in another direction, then the nation, through whose territory the river thus breaks its way, suffers injury by loss of territory greater than the benefit of retaining the natural river boundary, and that boundary remains in the middle of the deserted river bed. For, in truth, just as a stone pillar constitutes a boundary, not because it is a stone, but because of the place in which it stands, so a river is made the limit of nations, not because it is run-

ning water bearing a certain geographical name, but because it is water flowing in a given channel, and within given banks, which are the real international boundary.

"Such is the received rule of the law of nations on this point, as laid down by all the writers of authority. (See ex. gr. Puffend Jus. Nat. lib. iv. cap. 7, s. ii; Gundling, Jus. Nat. p. 248; Wolf Jus. Gentium, s. 106-109; Vattel, Droit des Gens, liv. i, chap. 22, s. 268, 270; Stypmanni, Jus. Marit. cap. v. n. 476-552; Rayneval, Droit de la Nature, tom. i, p. 307; Merlin, Repertoire, ss. voc. alluv.)

"I might multiply citations to this point from the books of public law. But, in order that either the United States or the Mexican Republic, whichever in the lapse of time shall happen to be inconveniently affected by the application of this rule may be fully reconciled thereto, it seems well to show that it is conformable to the common law of both countries.

"I subjoin, before doing this, as authority for Mexican jurists and statesmen, citation from the works on international law of the highest authority in Spain and Spanish America.

Don Antonio Riquelme states the doctrine as follows:

"When a river changes its course, directing its currents through the territory of one of the two conterminous states, the bed which it leaves dry remains the property of the state (or states) to which the river belonged, that being retained as the limit between the two nations, and the river enters so far into the exclusive dominion of the nation through whose territory it takes the new course. Nations must, of necessity, submit their rights to these great alterations which nature predisposes and consummates. * * But, when the change is not total, but progressive only, that is to say when the river does not abandon either state, but only gradually shifts its course by accretions, then it continues still to be

the boundary, and the augmentation of territory, which one country gains at the expense of the other, is to be held by it as a new acquisition of property." (Derecho Internacional, tom, i, p. 82.)

Don Andres Bello and Don Jose Maria de Pando both enunciate the doctrine in exactly the same words, namely:

"When a river or lake divides two territories, whether it belong in common to the conterminous riparian states, or they possess it by halves, or one of them occupies it exclusively, the rights, which either has in the lake or river, do not undergo any change by reason of alluvion. The lands insensibly invaded by the water are lost by one of the riparian states, and those which the water abandons on the opposite bank, increase the domain of the other state. But if, by any natural accident, the water, which separated the two states, enters of a sudden into the territory of the other, it will henceforth belong to the state whose soil it occupies, and the land, including the abandoned river-channel or bed, will incur no change of master." (Bello, Derecho Internacional, p. 38; Pando Derecho Internacional, p. 99.)

Almeda refers to the same point, briefly, but in decisive terms. He says:

"As the river belongs to the two nations, so, also, the river-bed if by chance it becomes dry, is divided between them as proprietors. When the river changes its course, throwing itself on one of two conterminous states, it then comes to belong to the state through whose territory it runs, all community of right in it so far ceasing." (Derecho Publico, tom. i, p. 199.)

"Leaving authorities of this class, then, let us come to those which discuss the question in its relation to private

rights, and as a doctrine of municipal jurisprudence.

"The doctrine is transmitted to us from the laws of Rome. (Justinian. Inst. lib. ii, tit. i, s. 20-24; Dig. lib. xii, tit. i, l. 7. See J. Voet ad Pandect. tom. i, p. 606-607. Heinec. Recit. lib. ii, tit. 2, s. 358-369; Struvii Syntag. ex. 41, c. 33-25; Bowyers' Civil Law, ch. 14.)

"Don Alfonso transferred it from the civil law to the Partidas. (Partida iii, tit. 28, l, 31.) Thus it came to be, as it still remains, an established element of the laws of Spain and of Mexico. (Alvarez, Institucions, lib. ii, tit i, s. 6; Asso. Institucions, p. 101; Gomez de la Serna, Elementos, lib. ii, tit. 4, sec. 3, no. 2; Escriche, Dic. s. vocc. accession natural, aluvion, avulsion; Febrero Mexicano, tom. i, p. 161; Sala Mexicano, ed. 1845, tom. ii, p. 62.)

"The same doctrine, starting from the same point of departure, made its way through the channels of Bracton into the laws of England and thence to the United States. (Bracton de Legg. Angliae, lib. ii, cap. 2, fol. 9; Blacks. Comm. vol. ii, p. 262; *Woolrych on Waters*, p. 34; *Angell on Water Courses, ch.* 2; *Lynch v. Allen*, iv, De. & Bat. N. C. R. p. 62; *Murry v. Sermon*, i. Hawks N. C. R. p. 56; *The King v. Lord Scarborough*, iii B. & C p. 91, S. C. ii, Bligh N. S. p. 147.)

"Such beyond all possible controversy, is the public law of modern Europe and America, and such, also, is the municipal law both of the Mexican Republicand the United States." Vattel states the rule thus at page 121. (Book i, ch. xxii, sec. 268.)

"If a territory which terminates on a river has no other boundary than that river, it is one of those territories that have natural or indeterminate bounds (territoria arcifinia), and it enjoys the right of *alluvion;* that is to say, every *gradual*

increase of soil, every addition which the current of the river may make to its bank on that side, is an addition to that territory, stands in the same predicament with it, and belongs to the same owner. For, if I take possession of a piece of land, declaring that I will have for its boundary the river which washes its side—or if it is given to me upon that footing, I thus acquired beforehand, the right of *alluvion;* and, consequently, I alone may appropriate to myself whatever additions the current of the river may insensibly make to my land. I say "*insensibly,*" because, in the very uncommon case called *avulsion,* when the *violence* of the stream separates a considerable part from one piece of land and joins it to another, but in such manner *that it can still be identified,* the property of the soil so removed naturally continues vested in its former owner. The civil laws have thus provided against and decided this case, when it happens between individual and individual; they ought to unite equity with the welfare of the State, and the care of preventing litigations.

"In case of doubt, every territory terminating on a river, is presumed to have no other boundary than the river itself; because nothing is more natural than to take a river for a boundary, when a settlement is made; and wherever there is a doubt, that is always to be presumed which is most natural and most probable.

"As soon as it is determined that a river constitutes the boundary line between two territories, whether it remains common to the inhabitants on each of its banks, or whether each shares half of it, or, finally, whether it belongs entirely to one of them, their rights, with respect to the river, are in no wise changed by the alluvion. If, therefore, it happens that, by a natural effect of the current, one of the two territories receives an increase, while the river gradually encroaches on

the opposite bank, the river still remains the natural boundary of the two territories, and, notwithstanding the progressive changes in its course, each retains over it the same rights which it possessed before; so that, if, for instance, it be divided in the middle between the owners of the opposite banks, that middle, though it changes its place, will continue to be the line of separation between the two neighbors. The one loses, it is true, while the other gains; but nature alone produces this change; she destroys the land of the one, while she forms new land for the other. The case cannot be otherwise determined, since they have taken the river alone for their limits.

"But, if, instead of a gradual and progressive change of its bed, the river, by an accident merely natural, turns entirely out of its course and runs into one of the two neighboring States, the bed which it has abandoned becomes, thenceforward, their boundary and remains the property of the former owner of the river (Sec. 267); the river itself is, as it were, annihilated in all that part while it is reproduced in its new bed, and there belongs only to the State in which it flows."

This is the uniform opinion of publicists on this question, and leaves nothing further pertinent to the controversy.

The case of *Indiana v. Kentucky*, 136 U. S., 479 and the earlier cases reviewed therein, do not assist the present inquiry. The question there, was, whether the boundary between the two states was the north bank of the Ohio, and was to be determined, in the first instance, by a construction of the terms of the act of cession of the state of Virginia to the United States. There was also the further very important consideration, upon which the court laid great stress, that Kentucky had exercised jurisdiction to that bank, and had done so with the acquiescence of Indiana, and that titles had been granted and held upon that theory. The question of

accretions, although adverted to by counsel for Indiana, in the course of their argument, did not receive attention from the court in its very exhaustive opinion.

FOURTH POINT.

In 1877, when the sudden change took place, the boundary between these states was the middle of the main channel of the river as the same ran at that time. Further changes have since gradually taken place, the river continuing to cut the Iowa shore into sections 27 and 28 on that side of the river, at the same time adding to the Nebraska shore south of 22 and 21.

The whole testimony shows that the main channel of the river during all the period covered by this inquiry, was and still continues against the Iowa shore, and this main channel is the true boundary. In the bill, the plaintiff's claim to the territory and jurisdiction is particularly stated, and possibly more favorably to the defendant than the facts shown in the proofs justify.

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IN THE SUPREME COURT

—OF THE—

UNITED STATES.

STATE OF NEBRASKA
vs.
STATE OF IOWA,
} BILL IN EQUITY.

AND

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vs.
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} CROSS-BILL.

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JNO. Y. STONE, *Attorney General*, SMITH McPHERSON, AND J. J. STEWART, *Of Counsel for the State of Iowa.*

BRIEF FOR THE STATE OF IOWA.

P. C. KENYON, LAW BRIEF PUBLISHER, DES MOINES.

P. C. KENYON, LAW AND COMMERCIAL PRINTER, DES MOINES, IOWA.

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BRIEF FOR THE STATE OF IOWA.

STATEMENT.

This is an original suit in equity to determine the boundary

line between the states of Nebraska and Iowa, for a short distance between the cities of Council Bluffs and Omaha.

The state of Iowa was admitted into the union in December, 1846, its western boundary being, so far as material to this case, and as shown in plaintiff's bill, "Up the middle of the main "channel of the Missouri river."

The state of Nebraska was admitted into the union in 1867, its eastern boundary, so far as material to this case, being as declared, "Down the middle of the channel of said Missouri "river."

In 1851, the government surveyors meandered the Iowa bank of the Missouri river, and it is admitted that this meandered line was at or near the line of the Iowa shore when that state came into the union in 1846. In 1856, the government surveyors meandered the right or the Nebraska shore. There is no dispute as to these two lines. Being the only lines surveyed or run up to the time of their respective dates, there is no evidence as to the precise line of "the middle of the main channel" of the river as it was in 1846 (or 1851), when Iowa was admitted into the union. There having been no accurate line of the middle of this channel taken or preserved, we can only ascertain it by taking the average width of the river channel, as shown by the witnesses, and dividing it between the two states. Plaintiff's witnesses show this width to have been as follows:

Rustin, 2,000 to 2,500; Smiley, 2,500 to 3,000; Tostevin, 1,300 to 1,400 feet. This is the only evidence there is on this point. But in order to render the ascertainment of the middle of the channel simple and easy, defendant, in its answer and cross-bill, insists upon a medium line between the two meanders as the boundary. This could be arrived at more equitably by taking the line midway between the two shore lines as shown on the map for the year 1851. The state of Iowa claims that the middle of the channel of the river, as it ran and flowed in 1846, when the meander line of 1851 marked the east bank, is

the boundary now. Since then important and rapid changes have occurred in the river, on account of the rapidly shifting character of its banks, and the plaintiff claims that the middle of the stream, as it now runs, is the boundary, except as to the northern part of the tract which was suddenly cut off in a few hours, in 1877, when the river cut across the neck of a long bend, thus suddenly making a new short channel and abandoning the old bed.

The plaintiff alleges that these changes were gradual and imperceptible. The defendant charges that they were rapid, visible and measurable, and that they occurred with such suddenness as to render the doctrine of accretion entirely inapplicable to them. The evidence shows that from 1863 to 1877, about two thousand acres of land caved in and washed away from the Iowa shore, and that an area of an equal quantity, at the same time, formed against the Nebraska shore. The evidence further shows that most of this change occurred during the five or six years preceding the sudden cut-off in 1877. As to the effect in a legal sense of this sudden cut-off, which occurred in a few hours in 1877, no question is made by the parties, and the point to be determined is whether the area of land, consisting of about two thousand acres above mentioned, was formed so imperceptibly and gradually as to belong to Nebraska, or whether it was formed so rapidly and suddenly as to belong to Iowa. It should be here noted that the sudden cut-off in 1877, above mentioned, by which a long course of the river around a large bend was suddenly shortened across the neck, and a new channel formed in such a way as to place a large tract of land on the Iowa side of the Missouri river on the other side, as that channel ran after this sudden change. The claim of Iowa is that all of the land made south and east of the center line of the main channel of the river as it ran in 1846 or 1851, belongs to the jurisdiction of the state of Iowa.

It is claimed by the defendant that the Missouri river is a

river of the first class, and that the amount of water that flows down it is very large and varies greatly in amount; that within the limits or *termini* of the two meander lines, at the point in controversy, the stream flows through a plain bounded by bluffs which are three or four miles apart. The whole of the plain between said bluffs is composed of a soft, friable, sandy loam, not protected against the action of the water, and very easily susceptible thereto. It readily and rapidly yields to the force of the current, and banks formed of such soil afford no resistance to the changes of the rapidly flowing water. This plain is also level, being as low at the base of the bluffs on either side, as it is in the center, and therefore the force of gravity does not help to confine the river to any certain part of it. The current of the Missouri river is very rapid, varying at different times, and with the time of the year, and the stages of the water, at from five to ten miles an hour. The river is subject to annually and semi-annually recurring freshets, usually happening in June and April, and popularly known as the "June rise" and the "April rise," during which for a few weeks, the amount of water flowing down the Missouri river is increased to many times its ordinary and usual volume of water, and the river leaves its maximum channel and spreads over a large part of the plain. During these freshets the process of change is very rapid, especially while the water is subsiding. While the water is up over the banks it frequently cuts over the necks of points entirely forsaking its former channel, and while it is subsiding, it cuts away its banks on one side and builds them up on the other as rapidly as ten to one hundred and fifty feet within twenty-four hours.

The testimony of George Smith, a very intelligent witness, and a civil engineer, introduced by plaintiff, gave, in his cross-examination, perhaps the fullest description of the peculiar character of this river plain. He said, in substance, that there was more change in one year possibly than another, but it was

all by abrasion, or what he called "accretion." The abrasion of the banks of the Missouri river differs from rivers that have clay banks. The bottom is composed of quicksand that has been "chewed" over a great many times by the Missouri river. The current against the bank eats into it until by so doing it eats out a little shoulder; the water undermines it and then carries a shoulder fifty feet wide, taking it out and running it down stream, sometimes for many months. The edges wearing away does not come by pressure upon a continuous smooth bank, but the water cuts into it a little shoulder or pocket and carries it along until it comes to the end of the bank where the current goes to the opposite shore. It takes off these shoulders ten, fifteen and twenty feet, the quicksand dissolving away. Every few hours you will hear the pitch of the bank into the river. There is a constant wear of the banks, and pieces are constantly falling in, but the most rapid abrasion is where it cuts a little shoulder. Usually, after a flood, and the high water has permeated the soil, when the water runs down in July and August, the soil is so thoroughly saturated that the pressure of the current when the water is receding will carry away the banks in quantities. They are carried away most rapidly after a flood and then the current goes almost where it has a mind to. Pieces torn off are dissolved into the river. Sandbars in the Missouri river form where there is the least current and agitation. They are liable to be swept away when the river falls. These sandbars operate sometimes to change the banks of the river by becoming bold enough to force the current against the shore to abrade it. The channel of the Missouri river is something over which man nor nothing else seems to have any control. The character of the soil and the material that composes the Missouri river bottom land varies. A great deal of it is silt formations and old river beds. A cross-section any place across this bottom will show some old river bed. In places there is a very tough clay called gumbo, and in others a natural sieve and easily

permeated clay. On top there will be a loamy, rich soil, with grass and trees growing upon it if the soil is old enough. Below these are cottonwood trees, old drift and sand. There are deposits of good plastering sand and gumbo, and the different kinds alternate. Everything in sight looks like natural soil, but upon studying it, all the different kinds of deposits can be found within a few rods or miles.

The reason why such material as this is so easily changed by the action of the water, and why the river bed of the Missouri may be shifted and changed so easily, is because sand will not stand perpendicularly. Any quicksand or rock deposit down to sand, will not stand at more than forty-five degrees elevation. The action of the water will dissolve it and carry it away, and so it is bound to go into the river. This soil is not a permanent native soil like the clayey bluffs on either side, which would stand the pressure of water that comes against this conglomeration of quicksand and silt. The silt deposit down to where the material is permanent, is sixty-five feet or more in depth. In putting down a pier for the Union Pacific bridge, a pine log a foot and a half in diameter was found on the bed rock, sixty-five feet below the surface of the water. The changes made by the current of the stream are made more rapidly after a flood which has saturated the soil. The banks would drop more readily after a week's flood that had flooded the whole bottom. Every June there is a flood that fills the banks full, and sometimes the bayous. In times past the whole bottom has been traversed by the Missouri river. He never noticed how rapidly this particular new land was made. It was done each year more rapidly after a freshet, because that usually softened the ground. In his experience and knowledge as an engineer there is no other river like the Missouri as to the character of its bottoms and shores. As a student of the art of civil engineering and of the great rivers of the world, he does not think he has ever read of

any other stream of like character with the Missouri, or of any others that are guilty of such performances.

Another witness, Thomas Tostevin, an experienced and capable civil engineer, who was introduced by both sides, stated in his testimony, delivered on behalf of the plaintiff, that the bottom on each side of the Missouri river is alluvion, showing evidence of having been carried or deposited; it is not possible to tell how many times it has been moved; it is probable in the past it has been moved a great many times. The soil is partly sand and partly clay and partly vegetable matter. It is susceptible to the action of the water and easily separated by it, except in places where clay beds, ordinarily called gumbo, have been formed. These have better power of adhesion and resistance to the action of the water than the neighboring soil. The soil drops into the river on account of the current impinging upon the friable banks. This has a tendency to undermine them and deprive the superincumbent mass of its foundation. The water washes away this foundation and this mass falls in. Between 1868 and 1877 there was nearly three-quarters of a mile in width (at the point in issue) formed of this eroded area. While the erosion was going on on the one side, the alluvial deposit corresponding to the erosion in area was formed on the other. The river maintained its width during these changes, having the same comparative width after the floods.

The testimony of these two men of science and experience will be sufficient upon the general character of this stream and river plain.

At the point in controversy, the Missouri river runs through a flat, alluvial plain, bounded on either side by bluffs from 250 to 300 feet high, which are three miles and a half apart and run north and south parallel with each other. The city of Omaha is built upon the slope of the western line of bluffs, and the city of Council Bluffs on the slope of the eastern bluffs. The river runs close to the bluffs on the Omaha side, and the city of

Council Bluffs extends westward over the bottom. The city limits of Council Bluffs, as established by act of the legislature in 1857, extend west to within half a mile of the western line of bluffs (mid-way of the two red lines running north and south on the map), and north to the north line of sections 21 and 22, the northern boundary of the tract in controversy. In 1851, five years after the admission of Iowa into the union, a survey was made by the United States government of the left or Iowa bank of the river, which was the first determination of the location of the river, and must be taken under the pleadings as its location on the admission of the state to the union. This line is marked in blue upon the map. At that date the river ran south close to the Iowa bluffs to a point two miles and a half north of the center of Council Bluffs. It there turned abruptly to the west and ran directly west across the bottom nearly to the Nebraska bluffs, there turning at a right angle and running south past the city of Omaha. Five years later, the United States surveyed the Nebraska bank of the river. By this survey it appeared that the river had changed its position at almost every point, the greatest change having been made on the center line of section 22, in what is called Busha's bend. There the river had during these five years removed itself southward more than its own entire width — about 1,400 feet, 1,300 feet of which had in 1851 been covered by the waters of the river, and 100 feet of which had been then upon the Iowa side, being now all built up in dry land again and added to the Nebraska shore. For the next ten years the river at this point moved but slowly. In the spring of 1866 it was but a short distance south of the center of the north half of section 22. No survey was made of either river bank in this year, but the testimony of the witnesses shows that the river in the spring of 1866 ran about 300 or 400 feet south of where it ran in 1856. By the testimony of Mr. Harl (abs., p. 60), it appears that there were 160 acres of the farm they bought at this point south of

the river. This was the Busha farm, which was all in the north half of section 22, and which in 1856 contained about 180 acres. That only about 20 acres along the whole north side of it had gone, would show that the river had moved south only a few hundred feet. That this was the position of the river at that date was confirmed by the testimony of several of the plaintiff's witnesses. Mr. Rustin (abs., p. 2) says: "In 1864, the river "ran a little south of the center of the north half of section 22." J. A. Swobe (abs., p. 19) says that in 1863 the river ran not far from where it ran in 1856. Mr. Marsh (abs., p. 26) says that in 1863 the river ran similarly to its course in 1856, except that it had dropped down lower in section 22. Mr. McPherson (abs., p. 34) says that there was very little cutttng going on in 1856; that the cutting in the Busha bend was very slow and not perceptible; that the first heavy cutting was some time in the sixties—in '62 or '63, he thinks. The same witness says (abs., p. 42) that he thinks there was a change between 1856 and 1863. He cannot tell how far it had worked up to 1862, but the changes from 1863 on were more extreme. He is not positive, but he knows the extreme changes commenced somewhere in the sixties. Mr. Jones says (abs., p. 46) that in 1862 he surveyed the quarter line of the north half of section 22, which runs through the center of the north half, and at that time the river was cutting on this line. Taking the testimony of all these witnesses together, it is evident that in the spring of 1866 the river was only a short distance south of the center of the north half of section 22. The next determination of the position of the river was the survey of the Iowa bank by the Union Pacific railway surveyors, in 1868. By this it is shown that the left bank of the river had removed itself in Busha's bend 2,100 feet south of the line of 1856, or about 1,700 or 1,800 feet from where it had been in the spring of 1866. This extensive cutting is described by witness Harl (abs., p. 60), where he tells of the river's washing away 145 acres of their farm situated

at this point, in the spring of 1866. All the other witnesses whose recollection extends to this period speak of the high water of '66 or '67 and of the great amount of cutting while the river was falling after it. The testimony shows that most of this 1,800 feet was cut away from the Iowa shore and added to the Nebraska shore in the spring of 1866, and that the river displaced itself more than its own entire width during a month or two in that year. In the next seven years the river moved about 1,500 feet at the point of Busha's bend, the survey made by the Union Pacific surveyors in 1875 showing that the Iowa bank was about 1,500 feet southeast of where it had been in 1868. In the spring of 1875 commenced a second period of rapid cutting. The Union Pacific surveyors made another survey in 1876 which showed that the Iowa bank had moved 1,800 feet since the year before, and in Saratoga bend the river had cut into the Nebraska shore 900 feet. In January, 1877, the river had moved 1,100 feet further, and from January until June, 1877, 1,300 feet still further into Busha's bend; and in Saratoga bend, 900 feet until January, 1877, and from January until June, 1877, it had cut 2,000 feet into the Nebraska shore in the northeast part of Saratoga bend. This last survey was made immediately before the cut-off. The river had in the meantime cut back on the lower side of the bend about 1,500 feet, leaving a narrow neck of land from 100 to 300 feet wide, and through this the river broke suddenly in June, 1877. Since that time the channel of the river has remained stationary in Busha's bend proper, the present Iowa shore line being almost identical with the shore line of 1877 down nearly to the locality where the cut-off was made. Two noteworthy changes, however, have occurred. The current flowing directly against the Omaha bank after the cut-off, resulted in cutting into it about 2,000 feet from June until October, 1887, when its further encroachments were stopped by the erection of a stone riprap. Since that time also, the river has worked itself

south about 1,500 feet, or its present width, in the locality of the cut-off, straightening its course in that vicinity. And the river now runs in a straight line a little south of west across the bottom and nearly parallel with its course in 1851, and from a mile to a mile and a half south of its original position. The survey of the Nebraska bank in Busha's bend and of the Iowa bank in Saratoga bend, show that the additions to the opposite shore were in proportion to the cutting on the one shore, sustaining the statements of every one of the witnesses examined upon the subject. In Busha's bend from January until June, 1877, 800 feet was added to the Nebraska shore; from the 1876 survey to the 1877 survey, 800 feet; from 1875 until 1876, 1,400 feet; and from 1868 to 1875, about 2,000 feet. This last is an approximation, for the 1868 survey of the Nebraska bank was not continued around into Busha's bend. These last distances are all given for Busha's bend. In the northeast angle of Saratoga bend, 1,600 feet was added to the Iowa shore from January until June, 1877; 1,100 feet from 1876 until January, 1877; and 600 feet from 1875 to 1876. In the northwest angle of Saratoga bend, there seems to have been no cutting to speak of from 1851 to 1868. From 1868 until 1875 the river there moved 2,400 feet, and from then until the time of the cut-off, 200 or 300 feet. All these distances are shown on maps in evidence as indicated thereon. The river has cut with extreme rapidity for a year or two at a time in certain portions of each of these bends, leaving the remainder comparatively undisturbed. This spasmodic action is explained by the existence of gumbo beds which are composed of a tenacious clay which almost completely resists the action of water. When the river strikes one of these beds it has great difficulty in getting through it, taking years to advance a few feet. The river is impinging upon one of these gumbo beds in Busha's bend at the present time, and has been since 1877; and, in consequence, it has ad-

vanced hardly at all for the last fifteen years in that locality. But as soon as the river cuts through a gumbo bed, the porous sand and loam composing most of the bottom, offers little resistance, and the river tears through it with great rapidity if the other conditions are favorable; that is, if the ground has been saturated by high water and the current is directly impinging upon the bank. This happened in Busha's bend in 1866 and in 1876 and 1877, and down below the cut-off after the cut-off in 1877. Under these conditions the bank would be cut away at the rate of ten to 150 feet in twenty-four hours, and from 800 to 2,000 feet in the course of a month or two; and an equal amount of sand-bars and land would appear on the other side.

The contention of the state of Iowa in this case is that the boundary of its jurisdiction and sovereignty is on the same line that it was in 1846, which is approximately a line drawn midway between the Iowa meander of 1851 and the Nebraska meander of 1856; that the above inscribed changes of the river were rapid, appreciable and measurable, and that the boundary of the state did not change on account of them; that the 2,000 acres of land in controversy, which was cut off from the Iowa shore and built up again on the Nebraska side of the river, and which is in all respects the same as it was in 1846, except that the river is now south of it instead of north of it as then, is now and always has been in the state of Iowa. The mode of formation of this land was as follows: During high water when the river was cutting rapidly into the Iowa shore and removing itself to the southward, on the opposite side where the water was still and slack, a large amount of mud and sand was deposited upon the bed of the river; and when the water had subsided, a sand-bar would appear corresponding in width to the amount of land which had been cut away from the Iowa shore. This sand-bar would quickly grow up with grass and willows, and by the action of the wind blowing sand and

deposits in subsequent high waters, would in a short time be as firm and solid land as the other portions of the bottom.

We present below a very brief summary of the evidence bearing upon the changes actually made within the termini of the two meander lines covering the area in question:

EVIDENCE.

John A. Smiley.

Abstract, page 6: He is able to tell from the fact that the river came very near his land, and he was anxious lest it should be washed out, and it was valuable property. The river was cutting rapidly when he first came here. Most rapidly toward the north. In section 2, in Nebraska, it was cutting east and west at the same time, and in section 22, on the Iowa side, was was cutting into the Iowa shore. It is the rule of the Missouri river that as it cuts on one side it fills proportionately on the opposite side. That is the fact in relation to this entire bend and has been for more than thirty years. The river has practically kept its natural width, not changing it at any one point, and flowing over only a little ground at a time, and keeping its own width by cutting on one side and filling on the opposite side.

Page 8: His house was about two miles from where this land was made on the east side of the channel and a mile and a half from the channel of the river. His recollection is that there had been over 2,000 acres of land formed there in eighteen years, immediately against the Nebraska shore. These changes could be discovered if he were making surveys there, and if a man were riding horseback or driving a team there, he would find that several feet of ground had been lost.

J. A. SWOBE.

Page 20: The changes in the channel of the river occurred in this manner: There would be sand-bars in the river which kind of roll or change from place to place. The current or channel changes from time to time. The changes in the sand-bars or current would not affect the shore immediately or directly. The water running against the bank was what changed the shore. The changes in the channel of the river might force the water against the bank at some other point than where it had been striking. An overflow has no effect in forming land. A deposit of sand will be left wherever the river overflows the land. When the river falls it leaves a deposit of sand, but there has to be a bar there. Bars are formed in the ordinary stages of water by the river cutting on one side when a bar generally forms on the other. One side of the river caves in and the sand washes up on the other side and fills it up. The river is the most active, and there is the most commotion in the water, on the cutting side. The water on the other side is still, and that is what causes the deposit to go on.

Page 21: High waters in the Missouri river come in April and June. The river overflows the low land during the June and April rises, and where it overflows it leaves deposits.

Pages 22 and 23: The bank was falling away while he was hauling wood from the Iowa shore. The company bought a strip of land 200 or 300 feet wide, near the river, from which they were cutting wood. In 1867 he thinks this strip all fell in that year and formed on the other side. It was a strip from half a mile to a mile long, along the bank of the river, with cottonwood and big willows on it. There is approximately about 2,000 acres of land in the area north of the river where it now runs, and east of it, as it was before the cut-off in 1877. was familiar with this bottom and the country from 1863 to 1867. From the time he knew it in 1863, nearly all of this

2,000 acres of land was at some time run over by the regular channel of the Missouri. It so changed from time to time to produce this result. This land was made by the falling away of several hundred feet per year on the Iowa side, and filling in as rapidly on the opposite shore. A great deal more of this ground fell in in some parts of the year than in others, mostly falling in at certain stages of the river. Most of it would fall in the spring, from March until July or August. It always deposited as rapidly on the Nebraska side as it cut from off the Iowa shore, leaving the width of the stream about the same. It is true that the Missouri river ran at some time or other from 1863 to 1877, over about all the space south of the line from the northeast corner of section 10 in Iowa to the northeast corner of section 10 in Nebraska, down south to where the river bed is now. The Missouri river itself ran over nearly every portion of this at some time during that period. This is true of all this land except 200 or 300 acres in sections 20 and 21.

Pages 23 and 24: The river was cutting south into Iowa in sections 20 and 21, and north into Nebraska in sections 1, 2 and 3 at the same time, and continued to do so until 1877, when the cut-off occurred. The strip in section 22 that was bought for wood was 300 or 400 feet wide. They cut wood there in the winter of 1867 and hauled it off in the spring. During this time the river was cutting pretty strongly there, and during the course of the year it cut out a large portion of the strip. This was a season when there was a great deal of water and a big flood. This cutting occurred both before the water overflowed the banks and after they had subsided. * * * The way the river cuts is by undermining the banks so that the surface falls in sometimes. The river preserves its length and width. As it would cut and undermine and the bank would fall in, the main body of water would hug the Iowa shore, leaving still water on the Nebraska shore, and there would be a constant deposit of sand and silt held in suspension by the water. So

that while pieces of dirt may fall in on the Iowa shore, the formation on the opposite side was a slow and imperceptible process of deposition. This was true of sections 1, 2 and 3 in Nebraska and sections 20 and 21 in Iowa. Chunks of dirt do not go across the river, but float off. When one falls in it becomes dissolved and its constituents float down the river. The material that comes down the river is what is caught here. (25.) He might go away two or three weeks and when he went back he could see quite a change and the shore was being added to rapidly on the other side. He could see the bar coming out there. On the Iowa side he could see chunks falling in but he could not see chunks forming on the other side. (27.)

W. W. Marsh.

The process was carried on by undermining the bank and it kept dropping in in sections. The land on the opposite side was formed by a deposit of the material that was in the water. * * * Whenever the waters of the Missouri river overflow, they leave deposits. Whenever they get still, they always commence to settle. The current is always on the side where the cutting is going on, but where the water is still the deposits take place. (27.)

Thomas Tostevin.

Page 31: All the land on the Nebraska side of the river, south of the old meander line of Iowa, has been removed and replaced by the action of the river and formed by deposit washed up and depositing the sands. This same process has gone on all along the river by washing the sand against the Nebraska shore and depositing the sand held in suspension by the water. After the basis is formed in this manner overflows would increase its height.

JOHN P. MCPHERSON.

Pages 34, 35, 36 and 37: On the Nebraska side of the river, opposite section 22, there was a filling process going on. The making of land on the opposite side took place as the river worked south. The land seemed to accumulate in proportion to the cutting on the opposite shore. The made land did not get to its full height at first; but in after floods, sediment would keep settling until it got to be the height of the bank. The same thing was going on on the Iowa shore, where the river was cutting into sections 2 and 3 in Nebraska. In all the length of these bends, in proportion to the cutting on one side, land would be formed on the opposite shore as a general thing. The formation of land to these different shores was done by the sediment in the water settling, and the current leaving the shore and hugging strong to the lower side of the bend, left the water slack on this shore and the water settled the sediment in it. That seems to be the process of forming land. Afterward, in the next high water, it would settle still more. He has known deposits two feet deep on the ground in Iowa on this land. * * * Immediately after a bar of land begins to form to a shore, its elevation is lower than that of the land which has been formed for some time. It would remain in the same height for that season after the high water was over for the year. When another rise came next season, it would build on again if it did not go away. As soon as the bar gets so that it is out most of the season cottonwoods and willows spring right up on it. When the high water comes the vegatation retards what little current there is and the sediment settles on it much faster. The wind blowing over the bottom has the effect of filling up this new made land. Anything moving settles like a snow drift, as it blows over the bank. The different benches in the bottom are designated in the following manner: The first that comes out of the river, after the river goes down,

is called a bar. It is nothing but dirt and sand, and it is lower than the old banks of the river. Then after it gets up so that it makes a bank, of which an edge is cut off square, it is called the first bench. Then after it is still higher, but not yet filled up to the old bank, it is called the second bench, and sometimes there is a slope that goes back farther into the bottom, that is called the third bench. The extreme high water overflows these places and the sediment settles from the water and makes these benches. The wind blowing sand and dirt constantly has a tendency to level up these benches to a certain extent. The wind does not carry so much sand as the water does sediment, but it is constantly at work. As he navigated the Missouri river in this vicinity, he could not see the formation of land to either shore, but he knew it was going on by appearance. It was under the water and out of sight, but he knew the land was forming there. He would notice the formation of the land when the water came down off of it, when he could actually see it. This was rather the result than the operation, but he could tell by the appearance of the water what was going on underneath it. From the fact of the water being slack he would know that it was settling there. He inferred that the formation of land was going on by the appearance of the water. He knows that when there is a current running strong on one side and slack water on the other shore, there is a considerable deposit going on where the slack water is. * * * The cutting was done by the water wearing the bank and in some places undermining it. In some places the lower soil would go out before the upper soil would, and the upper soil would cave in in slices and chunks. But at other times it seemed to undermine and a big piece would slide down. The piece that had slid in would wear away before any more of the bank would go in at that point. It had to wear away before the current could get at the bank again. The sand and earth that is worn away

goes off with the water and settles when it happens to get into a place where the water is slack.

Page 39: During high water, in some places, the current of the Missouri river makes sudden and considerable changes. Soaking the bank with water makes it soft, and the heavy current that is in the river strikes it and washes it out. The banks cut some in high water, but the heaviest cutting seems to be when the water recedes.

Page 42: The changes from 1863 on were more extreme. * * * The banks seemed to wash more from 1863. * * * During low water in the fall and summer, cutting on the bank would stop. Most of the cutting was done during the spring and June rises. Sometimes in extreme low water, when the upper part of the Busha bend had cut in the early part of the rise, as the water would recede, it would cut in the lower end of the bend. Most of these changes occurred twice a year. He had noticed twenty-five, fifty and seventy-five feet of the bank go in at one time. * * * Sometimes there would be timber on the parts that would go in. He had seen it wash in large trees at the lower end of the Busha bend, some of them a foot in diameter. Growing trees, if there were any on the land, would fall in. * * * There was a place right in this bend where the boats were tied that washed in. This was during high water. There was a high bank right near the house, and in high water they could often get the teams off the boat there. There were some farm houses on the Iowa side that were standing there and were washed away. This extraordinary cutting occurred during high water.

HENRY HOMAN.

Pages 47 and 48: Some years it worked in a good ways, 200, 300 or 400 yards. It used to be a mile or a mile and a half from the river to the old Council Bluffs lake, but now it is not 600 feet. He could not say exactly how far the river had

receded to the south in any one year, but thinks 300 or 400 yards in one high water. As the river went down, these banks cut very fast. Sometimes twenty or thirty feet in a day, would go off in chunks as the river receded; sometimes in an hour another chunk would fall off. When the river was falling it did its big cutting.

FENTON HARL.

Pages 60 and 61: In the spring of 1865, he and his father had bought a piece of land from Mr. Hammer in the region of what is now known as Cut-off Island. There was a brick yard and two houses upon it. The river commenced cutting in the spring of 1866, and took in the crop and dragged down one of the houses. They had to move their household goods out of their house and kept pulling it back a short distance all the time. There was 160 acres of land, and the river took it all off except about fifteen acres in that one season. He had a lot of timber and a boat fastened in a bend one night and in the morning went out and found it had all gone. More than sixty-five feet of the bank went away that night. The land below, that belonged to Murphy and Jeffries, was washed away afterward. He thinks there was somewhere near 200 or 300 acres cut off in that vicinity in that one season. While this was dropping off, land was being made on the other side. This land could not be seen as long as the water was high, but it could be when the water went down. The river, on the average, maintained the same width after it got down as before it went up. In the seasons subsequent to 1866, and prior to 1877, the river kept on cutting in this vicinity. He should judge there was something like a thousand acres altogether washed away. There was 140 acres of their land that went off that one season of 1866. He has seen a strip fifteen steps wide fall in at one time. It would cut off thirty or forty rods in the course of a season.

As near as he could tell as much as half of Cut-off Island was formed in the six years prior to 1877.

Pages 62 and 63: The river bounded their land on the north. He supposes that the west line was somewhere near the north and south line that subdivided the northwest quarter of section 22. It was more than a quarter of a mile from where the brick yard was located, before it was moved, on account of the water, to the south line of their land. They moved it clear to the south line and west toward the lower house. Then they had to move it again onto Murphy's land. They moved it first in 1866, in April. There was a flood that spring. They moved the brick yard after the flood. As the flood went down the land began to wash into the river. The brick yard was about one hundred feet from the bank of the river at the time they purchased the land. When they moved the brick yard the water was right up to it. The river had cut into their land nearly one hundred feet when they began to move the brick yard. They moved it to the south line and finally abandoned it in 1866.

Page 64: He has seen the land crack back and settle clear out of sight. It settles by sliding.

Pages 65 and 66: The Nebraska side was covered with willows, grass and vegetation; next it reached out as a sort of a sand-bar, and then came the water. This sand-bar would be above the water in ordinary stages. Grass and willows would grow there after a while. The sand would lodge in the grass and willows, but not as much as on account of the overflow of the river. There is a good deal of wind on the Missouri river, and a great deal of sand in the air. It lodges, but there is not much effect. The sand travels along the bottom. There are several banks along the Missouri river; the water bank, the second bank, and yet a third bank. The sand blowing along the river might strike against the lower level and lodge there and fill it up. This sand-bar projects out into the water, and

there would be a freshet and high water, and when the water went down, there would be a lot of sand on the sand-bar building it up, and it would be higher than before. There would be a deposit on the places that had already been exposed before the freshet. In addition to building up the old sand-bar, there would be a deposit built up during the year toward the Iowa shore.

M. S. Clawson.

Pages 67 and 68: Is acquainted with the action of the river in the vicinity of Cut-off Island. Has seen the bank going in in the bend north of Cut-off Island pretty rapidly. Has seen pieces of land going in there that were 20, 25 and perhaps 30 feet wide. A strip 50 feet wide would crack off and remain several hours before falling in. The current might change, and would frequently cut out the road which he had gone up for a load of wood. To get back he would then usually cut off the willows and go back through them. His having to cut his way back was a frequent occurrence. This cutting of the bank could be seen plainer after high water than at any other time. He has known the water to cut out land so rapidly that it was necessary to move a big boarding-house on the Iowa side. When he first knew this boarding-house it was 100 feet from the river. The width of the stream was preserved.

Pages 68, 69 and 70: The times when the river cut most rapidly was generally after high water. Extraordinary cuts generally occur after high water, which usually comes during the months of April and June. The process of cutting is, he thinks, by undermining. The river cuts away the soil beneath the surface a considerable distance back, and then the surface slips into the river. Before this slipping of the soil takes place there is a crack in the earth, usually 15 or 20 feet back from the shore, and then pieces slide in and are taken up by the water and carried away. The earth cut off from the Iowa side,

in the vicinity of section 22, has been carried down the river. Land is formed in the Missouri river, because the water is very slack in the short bends, and the deposits settle there. In high water the water runs very rapidly, more so than at ordinary stages, and with great volume and force, and sometimes it is very difficult to navigate it with a steamboat. * * * Upon this bar, when formed, subsequent waters deposited additional earth. Weeds, grass and willows sprung up.

Pages 71 and 72: The rapid cutting continued for two weeks to a month, until the water got out of the ground. In two or three weeks after high water he knows that a great deal of land has been taken out. Two hundred feet in ten days or two weeks.

JOHN HAMMER.

Pages 75 and 76: He has seen seventy-five feet washed out in the course of one flow. The land holds together in strips until a sufficient amount has been undermined and then drops off. Land forms on the opposite shore.

Pages 77 and 78: The river first undermines great cavities under the surface of the ground. When a freshet came he could see the ground crack back a distance and sink down into the river and wash away in a kind of a whirlpool. Then it would commence over again and gouge out the bank at some other place, at some other point of attack. That would break down in turn and so on around the bend of the river. The result of this rapid breaking down was to keep the bank somewhat uniform and then it would commence over again. It forms a sort of shoulder sometimes where the water cuts. On the other side of the river is a sand-bar made by deposits of material carried in suspension by the water. It grows up to willows and dirt settles in, then layers of dirt and sand are piled up again. The original sand-bars are made by deposits mostly of sand, with some mud in that holds it together. Cut-off Island was made in that way.

Page 79: The cutting would begin immediately after the April rise, as soon as the water began to fall. Then it would remain stationary until the June rise, when it would cut again and continue to cut until it reached its ordinary level. There would be, perhaps, a month's cut between the April rise and the June rise, and after the June rise another month of cutting.

Pages 79 and 80: He could not say exactly how much of Cut-off Island was formed during the period of 1870 to 1877. The northern part formed during that time he thinks about three-quarters of a mile in width and extending across the island. He thinks fully three-fourths of a mile in width has been added to the island since 1872 on the north. As the land dropped off on one side when the river was below the level of its banks, what would be going on on the other side would be unknown, unless you were riding over the very ground and sounding. He used to do this more or less, and as near as he could judge it would be filling in. He could see large areas of land, after the water had gone down, which had been formed while the waters were up. This would be where the changes were sudden and noticeable. The channel would not be any wider than before. As the land broke off on one side it would form responsively on the other.

MARTIN HUGHES.

Pages 83 and 84: He thinks the Iowa side was cut off most in 1866 and 1867. It was cut off more in these years than it did at any prior time. When it was cutting off on the Iowa side, after the water would go down, he could see great sand bars forming on the other side. The water would be about the same width after it got back to its usual stage as it had been before. He has seen probably 40 or 50 feet wide by 100 feet long on the Iowa shore cut off at one time in strips. He has seen pockets cut off. Directly after the water has gone down, after low water had come, he could see the re-building on the

other side. The water would be three or four weeks in going down. The cutting on the Iowa side occurred in a few months time during April, May and June. There would not be much cutting during the balance of the year. There would be no re-building on the other side except during these months.

BRIEF.

The case nearest like the one now before the court, that has ever been decided by this court, is the *City of St. Louis vs. Rutz*, decided February 2, 1891, and reported in 138 U. S. 226. It came up on findings of fact made by the court below, and for the purpose of making a comparison of the facts of the two cases, we quote from the findings of the court in the Rutz case so much thereof as is necessary for this purpose:

8. That between the years 1865 and 1873 the river front of the said surveys numbered 149 to 156 was washed away, so that in July, 1873, the river front of said lands only extended to the line marked "River Bank, 1873," on said map, and that said river bank thereafter continued to wash away and cave in until it reached the line marked "River Bank, 1884," on said map.

9. And the court further finds from the evidence, that such washing away of said river bank did not take place slowly and imperceptibly; but, on the contrary, the caving in and washing away of the same was rapid and perceptible in its progress; that such washing away of said river bank occurred principally at the spring rises or floods of high water in the Mississipi river, which usually occurred in the spring of the year; that such rises, or floods, varied in their duration, lasting from four to eight weeks before the waters of the river would subside to its ordinary stage, or level; that during each flood there was usually carried away a strip of land from off said river bank from 250 to 300 feet in width, which loss of land could be seen and perceived in its progress; that as much as a city block would be cut off and washed away in a day or two, that blocks or masses of earth from ten to fifteen feet in width frequently caved off and fell into the river and were carried away at one time; that, in the spring of 1872, Mr. Augustus A. Blumenthal, Jr., the

occupant of the land at the time, lived in a dwelling house situated on said survey No. 151, and the river had, since the year 1865, so encroached upon the land that the house was then but about four or five hundred feet back from the river bank and water's edge as it then existed. When the spring rise, or flood, occurred that year, the said Blumenthal became alarmed for the safety of his house, and immediately commenced taking said house down and removing the same further from the river bank, and, in so doing, worked six or eight days in succession, at the expiration of which time the bank had caved in and washed away so rapidly that the bank and waters of the river had approached within a few feet of the foundation of the house, and before the waters subsided carried away the greater portion of the foundation of the house, and the flood which came in the spring of 1873 carried away the residue of said foundation, with at least 100 feet more of the land; and that such caving in and washing away continued until the building of the dyke at the point indicated on said map, on the eastern side of the river, above the said lands, which dyke was built by the United States government in the years 1876 to 1878.

10. That the said washing away of the bank on the front of the said surveys was caused by dykes built by the city or St. Louis on the western side of the river, at the points where the same are indicated on said map, by causing the current of the river to flow over to and against the eastern shore; that the western bank of the river, opposite the plaintiff's said land, is rocky, and there appears to have been no material change in that bank since the first survey thereof by the United States government.

11. The court further finds that in 1853 there existed an alluvial formation or body of land on the western side of the river and near the Missouri shore, then called "Quarantine island," which in that year (1853) was surveyed by William H. Cozzens. The location and boundaries of said island are indicated upon said map, the same being shaded red, and having written thereon the words and figures, "Quarantine island, also called 'Arsenal island,' as surveyed in 1853." In 1858, the said island, in low water, extended to and adjoined the main land on the western or Missouri side of the river. At some time between the years 1853 and 1863, the greater portion of said Quarantine island washed away, so as only to leave remaining that portion thereof embraced within a second survey thereof, made by said Cozzens in January, 1863, the location and boundaries of which are indicated upon said map by the words, "Survey No. 411 of St. Louis land, school lands, Arsenal island, surveyed in 1863." The letters and lines thereof being shaded green upon said Exhibit B.

12. Said Quarantine island, since its survey in 1863, has been called "Arsenal island;" and at the time of said surveys of said island in 1853

and 1863, the same was situated on the west side of the main channel of the Mississippi river, and about a mile higher up the river than the lands described in the declaration; and no part of the same then extended down the river opposite said plaintiff's said lands.

* * * * * * * * * *

15. The court further finds, from the evidence, that there is not now, and was not at the time of the commencement of this suit, any land whatever above the surface of the water in said river, on the site or within the boundaries of said Quarintine island as so surveyed in 1853, nor upon the site or within the boundaries of said island as surveyed in 1863, but that the same was subsequently wholly washed away.

16. The court further finds that in the floods in the Mississippi river, before mentioned, large portions of the upper or northern end of said island washed away; that in such floods a bar formed each year below, and joined to the foot of, the island extending down the river for the distance of a quarter of a mile or more; that when the water subsided after such a spring flood, the surface of such bar appeared in sight above the surface of the water, but nearly on a level with the water, for the greater length of such bar; that during the first summer after such bar had formed willows grew upon it, and the flood which occurred the next succeeding spring deposited more sand and soil on the bar, which was retained by the willows, and the bar so formed was thus raised higher in each successive annual flood, so long as it was overflowed in high water, and this process was repeated at each succeeding flood by the formation of another bar below that formed by the preceding flood, which in turn was covered with a growth of willows and raised higher by each succeeding flood until it ceased to be overflowed.

17. The court further finds that such bars were not formed by accumulations of sand or soil washed up against the lower end of the island, but by the deposits, in times of flood, of soil and sediment upon the bed of the river below the island.

18. And the court further finds that before the said island was washed away the main and navigable channel of the Mississippi river was eastwardly of the island, but after the said bar was formed lower down the river in front of plaintiff's land the main and navigable channel of the river has been, and still is, on the west side of the said bars or island, and that since the said bars or island had so formed in the river in front of said surveys the boats navigating the river have not run between the bar or island and the bank of the eastern or Illinois shore of the river.

In deciding this case, this court, among other things, said:

It is contended by the defendant, not only that the plaintiff never had

any title to the bed of the river, but that when the dry land, of which he was in possession, was swept away by the river, and ceased to exist, his ownership of that land also ceased to exist. It is laid down, however, by all the authorities, that if the bed of the stream changes imperceptibly by the gradual wasting away of the banks, the line of the land bordering upon it changes with it, but that if the change is by reason of a freshet and occurs suddenly, the line remains as it was originally. This principle is recognized by the supreme court of Illinois in *Buttenuth vs. Bridge Company*, 123 Ill., 545-546, 17 N. W. R. 439, in these words: "The law as stated by law writers and in adjudged cases, seems to be that where the river is declared to be the boundary between states, although it may change imperceptibly from natural causes, the river, as it continues to be the boundary. But if the river should suddenly change its course, deserting the original channel, the rule of law is, the boundary remains in the middle of the deserted river bed. It is laid down by all the authorities that if an island or dry land forms upon that part of the bed of a river which is owned in fee by a riparian proprietor, the same is the property of such riparian proprietor. He retains the title to the land previously owned by him with the new deposits thereon."

And again, the court says:

Finding 10 shows a wasting away of the banks of the surface was caused by the dykes built by the city of St. Louis, on the western side of the river, which caused its current to flow to and against the eastern shore. And when land was formed again on the place where the plaintiff's land had been washed away, it became the property of the plaintiff and, although the land thus newly formed, extended the shore itself into the old bed of the river beyond the former shore line, such additional land belonged to the plaintiff as a deposit on that part of the bed of the river which was owned by him in fee.

And again, from the same decision:

It is found by the findings, 17 and 18, that the parts which formed below and were joined to the foot of Harrison island, were not formed by the accumulations of soil usually put against its lower end, but by the deposit, in times of flood, of soil and sediment on the bed of the river below the island; that before the island was washed away, or the land, the navigable channel of the river was eastwardly of the island, but after the bar was formed lower down the river, in front of the plaintiff's land, the main and navigable channel of the river was removed to the west side of the bar or island, and that since that time boats navigating the river have been run between the bar or island and the eastern shore of the river. It therefore appears that the dry land in question was

formed, and that part of the bed of the river which was owned in fee by the plaintiff or his grantor, as the riparian owner. * * * It is well settled that the owner in fee of the bed of the river or other submerged land, is the owner of any bar, island or dry land which subsequently may be formed thereon. *Mulry vs. Norton*, 100 N. Y., 424. *d N. E. R., 581.

Again :

The city of St. Louis, by virtue of its original title to the island, is still the owner in fee of the submerged site where the island existed before it was washed away. As its right, under the acts referred to, to acquire land was limited to land situated within the boundaries of the city, and on the west side of the middle of the river, it cannot acquire, indirectly and by implication or construction of law, land which it was not authorized to acquire directly and in pursuance of law. Nor is the land described in the declaration an accretion to the land in Missouri which the city of St. Louis acquired, a mile higher up the river, because the middle of the main channel of the river is the eastern boundary of the state of Missouri, and the land described in the declaration is east of the middle of the main channel of the river. The title to land acquired by accretion is a title acquired under the operation of the law of the state, which each state determines for itself. *Barney vs. Keokuk*, 94 U. S., 324. As the law of Illinois confers upon the owner of land in that state which is bounded by, or fronts on, the Mississippi river, the title in fee to the bed of the river to the middle thereof, or so far as the boundary of the state extends, such riparian owner is entitled to all islands in the river which are formed on the bed of the river east of the middle of its width. That being so, it is impossible for the owner of an island which is situated on the west side of the middle of the river, and in the state of Missouri, to extend his ownership, by mere accretion, to land situated in the state of Illinois, the title in fee to which is vested by the law of Illinois in the riparian owner of the land in that state. We must not be understood as implying that if an island in the Mississippi river remains stable in position, while the main channel of the river changes from one side of the island to the other, the title to the island would change because it might be at one time on one side and at another time on the other side of the boundary between two states. The right of accretion to an island in the river cannot be extended lengthwise of the river as to exclude riparian proprietors above or below such island from access to the river, as such riparian proprietors. *Mulry vs. Norton*, 100 N. Y., 424, 436, 437, 3 N. E. Rep., 581. It appears from the map, Exhibit B, that the so-called "Arsenal Island" extended as far down the river as is shown on that map, which was made from surveys in 1873 and 1884; and if the plaintiff

thereby has lost such newly formed land, and been deprived of access to the river in front of his surveys, then all the riparian proprietors down the river, as far as the bars have formed, or may form hereafter, in front of their land, must lose their titles, and surrender them to the city of St. Louis as a part of Arsenal island. Such rapid changes in these alluvial formations cannot transfer title from one proprietor to another.

This Arsenal island was the subject of the case of *Carrick vs. Lamar*, 116 U. S., 423, 6 Sup. Ct. Rep., 424, and in the opinion in that case is described as "a mere moving mass of alluvial deposits." To such a movable island, traveling for more than a mile, and from one state to another, the law of title by accretion can have no application, for its progress is not imperceptible, in a legal sense. As it is found, by finding 16, that the bar formed at the foot of the island in the flood of a single year extended down the river for the distance of a quarter of a mile or more in front of the surveys in question, and such bar subsequently appeared as a part of the so-called "Arsenal Island," the question arises as to when the transfer of it passed, if it did pass, from the plaintiff to the city of St. Louis. Whenever it occurred, whether when the sediment first commenced to form a deposit on that part of the bed of the river, or whether when it formed a bar which, though still submerged, could be discerned by soundings, or whether when it came so near to the surface that its extent could be discerned by navigators, or whether when it arose above the surface and became dry land, there must have been, in order to maintain the contention of the defendant, an instantaneous transfer of a quarter of a mile of land from the plaintiff to the city of St. Louis at one and the same moment of time. Such a transfer was not a title by accretion, within the meaning of the law on that subject.

The case of *Mulry vs. Norton*, 100 N. Y., 424, cited in the foregoing opinion of this court, is a very important one. That action involved the title to certain beach lands on the ocean shore at Far Rockaway. It was claimed that the earth or sand composing the beach had been so affected by the streams and tides of the ocean that its ownership was lost by the plaintiff's grantors, and subsequent deposits made within the same boundaries were acquired by the owners of Long Beach and islands belonging to the town of Hampstead. This reasoning was attempted to be supported under the rule covering the acquisition of real property by alluvion or accretion. In its opinion, the court says the evidence tends to establish the following facts:

The beach in question is within the same boundaries and with the exception of a narrow lagoon running cross-wise through it, is of the same form and shape now as it existed from the year 1685, when it was conveyed to the plaintiff's remote grantors by its Indian owners, to about the year 1835. Between 1835 and 1869 the changes in the surface of the ground took place which it is claimed worked the transfer of the ownership. At the commencement of the process of change, Long Beach consisted of two small islands lying southward of Hampstead bay, separated on the west from the beach in dispute by a navigable inlet called indifferently Hog Island, or East Rockaway Inlet, or Brockle Face Gut. The succession of beaches, islands, shoals, and channels extended some four miles. This inlet was about half a mile broad and communicated directly with the westerly end of Hampstead Bay. To the west of the inlet, a bar known as Coot's bar extended from the main land south to a point opposite Long Beach, forming the westerly shore of Hampstead bay, and from this west, a distance of about three miles, until it reached the westerly line of the town of Hampstead. The beach to the westward of the inlet during the period from 1835 to 1869 underwent a succession of changes which it is quite unimportant, if not impossible to follow in detail, and usually consisted of a line or group of bars, shoals, islands and channels extending from the inlet to the shore of the main land beyond the premises in dispute, but which were constantly undergoing physical changes by the influence of the laws to which they were naturally subject. These bars, shoals and islands were, from the operation of the tide, and wind in filling the channels separating them, occasionally joined together, and at one time, by the removal of the inlet in question to the westward, formed a continuous bar from Long Beach to a point west of the premises in dispute, and remained in that position for about three years. The removal of the inlet to the west was not uniformly effected by gradual progression, but frequently advanced in

jumps of a quarter to a half mile in distance, and frequently added or took away from the land, to which they were joined, sections of beach covering half a mile or less in extent, as the result of a single storm. During the period of time in question various inlets at different points upon this bar were broken through from time to time, and were used by vessels trading in Hampstead Bay until they were closed up by the action of the tide and wind, when other channels by the operation of natural causes would be opened in new places, and these openings would in turn become the channels through which vessels bound to and from Hampstead Bay would pass. About the year 1869 the inlets to the westward became closed up and the original inlet adjoined to Long Beach was re-opened and has since become the sole channel of navigation of vessels entering the bay from the east. The process described finally resulted in attaching the beach in litigation to the main land on the west, forming a continuous beach about 1,000 feet broad, from such main land to the inlet at Long Beach for a distance of four miles. This process also left a shallow and narrow lagoon or cove running inside of the beach in question from Hampstead Bay to a point a little to the westward of the terminus in dispute, and separating the ocean beach proper from the main land lying directly behind it. In 1725 the formation of Coot's Bar was of so prominent a character that it became the subject of the grant from its owner, the town of Hampstead, to one Hicks, and from that time to the present said Hicks, his heirs and grantees, have occupied and enjoyed the beach lying between the original island inlet and the west line of the town of Hampstead and reaching within about eighteen hundred feet of the premises in dispute. Portions of this beach have at times been submerged or washed away, and it has at times been cut into by the formation of new inlets to Hampstead Bay, but at all times has had some beach lying above the ocean tide and outside the high-water mark, capable of occupation and enjoy-

ment by its owners. The court below held under those circumstances that the extension of Long Beach to the westward was not made by the process of accretion. The opinion of the court is so full, clear, and so persuasive in reason so far as applicable to the case now before the court, and so ample in citation that we quote quite fully from it below:

There seems to be but little conflict in the authorities or even between counsel in this case as to what constitutes alluvion or accretion. It was held in *Rex vs. Lord Yarborough* (3 B. & C. 91,) "that accretion is an increase by imperceptible degrees." "The lord of the manor claims when there is a gradual accession to land adjacent." (Wash. on Real Prop., 58.) "The test of what is gradual as distinguished from what is sudden seems to be that, though witnesses are able to perceive from time to time that the land has encroached on the sea line, it is enough if it was so done that they could not perceive the progress at the time it was made." (Angell on Tide Waters, 1st ed., 71.) It was said in *Emans vs. Turnbull*, (2 Johns. 314): "that, if the marine increase be by small and almost imperceptible degrees, it goes to the owner of the land; but if it be sudden and considerable, it belongs to the sovereign." (Citing 2 Blackst. Com., 261; Harg. Law Tracts. 28.) "To acquire title to land by alluvion, it is necessary that its increase should be imperceptible." (*Halsey vs. McCormick*, 18 N. Y., 146.)

It would seem from these definitions that two insuperable objections exist to the claim of the appellant: one being that a large part of the formations, of which the beach in question now consists, was created anterior to the junction thereof with Long Beach and constituted property subject to acquisition and ownership by others prior to plaintiff's claim; and secondly, that the mode of progress of Long Beach to the westward was frequently by sudden removals of the inlet, and the consequent junction of large and perceptible sections of beach to the easterly lands—as the result of a sudden and violent operation of the tides. We, therefore, think the court below correctly held that the defendant did not acquire a legal right to the possession of the lands in question by his lease from the town of Hampstead.

It is also claimed by the appellant that even if he has failed to establish title in himself to the premises, that the plaintiff still is not entitled to maintain this action because of defects in his own title. It is argued that the beach in question having been once cut off from the mainland and surrounded by navigable water, thereby became an island, which, like other formations of land in tide water, was the property of the state.

The evidence establishes a continuous chain of title to the premises in dispute from its native Indian owners down to the plaintiff, covering a period of 200 years, and each conveyance bounding its grantee upon the Atlantic ocean. Under the law of this state such a description makes the line of high water mark the boundary of the granted premises, but it also carries with it the liability of such a line to fluctuate by the action of the water. These lines of description for a period of 150 years included the locus in dispute, and the same, with the uplands, was occupied and enjoyed by the plaintiff's grantors, and now remain the property of the plaintiff, unless the title thereto has been lost to his grantors through the causes referred to.

It is undoubtedly true that the proprietorship of lands may be lost by erosion or submergence. The one consisting of a gradual eating away of the soil by the operation of currents or tides, and the other of its disappearance under the water and the formation of a navigable body over it. The plaintiff's grantors have at all times since 1684 remained the owners and occupants of the mainland adjacent to the beach in dispute, and as such owners have been entitled to the rights which attend the title of littoral or riparian owners, "they would be entitled to whatever should be gained from the sea by alluvion or dereliction, and their title was liable to be lost by the advance of high water mark, bringing their lands within the ebb and flow of the tide." (*East Hampton vs. Kirk*, 84 N. Y., 218; 2 Blackst. Com., 262; *In re Hull & Selby Ry.*, 5 Mees. & Wels., 327.)

It is not, however, every disappearance of land by erosion or submergence that destroys the title of the true owner, or enables another to acquire it; for the erosion must be accompanied by a transportation of the land beyond the owner's boundary to effect that result, or the submergence followed by such a lapse of time as will preclude the identity of the property from being established upon its reliction. Land lost by submergence may be regained by reliction, and its disappearance by erosion may be returned by accretion, upon which the ownership temporarily lost will be regained.

When portions of the main land have been gradually encroached upon by the ocean so that navigable channels have been extended thereover, the people, by virtue of their sovereignty over public highways, undoubtedly succeed to the control of such channels and the ownership of the land under them in case of its permanent acquisition by the sea. It is equally true, however, that when the water disappears from the land, either by its gradual retirement therefrom, or the elevation of the land by avulsion or accretion, or even the exclusion of the water by artificial means, its proprietorship returns to the original riparian owners. (Angell on Tide Waters, 76, 77; Houck on Rivers, § 258.) Neither does the lapse of time, during which the submergence continues, bar the right of

such owner to enter upon the land reclaimed, and assert his proprietorship. (Angell on Tide Waters, 77-80, and cases cited.) It is said in Hargraves' Law Tracts (Sir Matthew Hale's De Jure Maris), 36, 37: "If a subject hath land adjoining the sea, and the violence of the sea swallow it up, but so that yet there be reasonable marks to continue the notice of it, or though the marks be defaced, yet if by situation and extent of quantity and bounding upon the firm land the same can be known, though the sea leave this land again, or it be by art or industry regained, the subject does not lose his property; and accordingly it was held by Cooke and Foster (M. 7 Jac. C. B.), though the inundation continue forty years."

"But if it be freely left again by the reflex and recess of the sea, the "owner may have his land as before, if he can make it out where and "what it was; for he cannot lose his propriety of the soil though it be for "a time a part of the sea, and within the admiral jurisdiction while it "so continues." And again: "As touching islands arising in the sea, "or in the arms of creeks or havens thereof, the same rule holds "which is before observed touching acquests by the reliction or recess "of the sea, or such arms of creeks thereof. Of common right, and "*prima facie*, it is true they belong to the crown, but where the interest "of such *districtus maris*, or arm of the sea, or creek, or haven, doth in "point of property belong to a subject, either by charter or prescription, "the islands that happen within the precincts of such private propriety "of a subject will belong to the subject according to the limits and "extents of such propriety." (See also Gould on Waters, § 166.) A case quite in point is referred to by the respondent's counsel as arising in Delaware in 1815, decided by the court of common pleas upon a learned opinion by Judge Wilson, a copy of which is attached to the plaintiff's brief. The case does not seem to be elsewhere reported. It arose upon the ownership of an island called Wilson's Bar, which had been created by alluvion upon land formerly contained within the boundaries of an island called Little Tinnicum, but which at some time had been worn away by the ocean. The court says: "The right to the new island, and "also to the land gained by alluvion or dereliction, all of which are gov-"erned by the same principle, follows the right to the soil which is cov-"ered by the water. Though the surface of the lower part of Little "Tinnicum was destroyed by the force of the winds and the waves, and "it was consequently overflowed by the water of the river, yet the "owner did not lose the propriety of the remaining land covered by the "water if it was regained either by natural or artificial means, it contin-"ued to belong to the original proprietor. The earth deposited on it "became his by right of alluvion, and of course this island formed on it "by such deposit became his. And though it probably has extended "beyond the limits of the old island, the addition is plainly alluvion."

It would seem also to follow as the necessary consequence of these rules, that the existence of the lagoon between the plaintiff's hotel property and the beach constitutes no obstruction to his proprietorship of the beach formation, however created, if located within the original boundaries of his possession.

Deerfield vs. Arms, 17 Pick., 43.

It was held in the case of *Railroad Co. vs. Schurmeir*, 7 Wall., 272, that a sand-bar in the Mississippi river divided from the mainland by a slough twenty-eight feet wide, and which at high water was entirely submerged belonged to the riparian owner, although the acts of congress made the river a public highway at the place in question. It is also said that "rocks and shoals lying along the margin of a navigable fresh river belong to the riparian owners."

Gould on Water, § 77.

The evidence in the case and the findings of the trial court concur in establishing the fact that during the period of change hereinbefore mentioned, portions of the beach in front of plaintiff's premises became submerged, but at all times there existed upon or near such premises, shoals, bars or islands,-which afterward became the nucleus around which gathered the deposits now composing the land subject to litigation. It seems to us clear that the owners of this property did not lose their title thereto by reason of the changes described, and that the state has not acquired any property therein. The sovereign succeeds to the ownership of such islands and formations only as are originally created and located in tideways outside of the boundaries of property subject to individual ownership.

The case of *Jeffries vs. East Omaha Land Company*, 134 U. S., 178, is not an authority in this case. In that case it was distinctly alleged in the bill that the changes made in the river and adjacent lands were made gradually and imperceptibly and that the formation of new land was by accretion. A general demurrer was interposed to the bill for want of equity, and this demurrer, of course, admitted the averments in the bill. The court says:

The grounds upon which the circuit court proceeded in overruling the demurrer to the bill were stated by it in its opinion in these words: (1). It being alleged in the bill that the added land was formed by imperceptible degrees, although the increase was great, resulting in the addition of many acres, yet the time during which it was made was

nearly twenty years, and the increase might have been going on imperceptibly from day to day and week to week, which, during the lapse of so many years, might result in the addition of all the lands, and hence the averment of the bill cannot be overthrown, notwithstanding what is known of the character of the Missouri river and the soil through which it flows, and of the rapid changes in its banks which are constantly going on.

Again, the court says:

It is distinctly alleged in the bill that the new land is an accretion to that originally purchased by the patentee from the United States. The rule of law applicable to such stated fact is thus stated by this court in *New Orleans vs. United States*, 35 U. S., 10 Peters, 662-117: "The question is well settled at common law that the persons whose land is bounded by a stream of water which changes its course gradually by alluvial formation, was still held by the same boundary including the accumulated soil."

Again, the court says:

The bill must be held to state a fact in stating that the land in question was formed by imperceptible degrees, and that the process, began in 1853 and continued until 1870, resulting in the production by accretion of a tract of forty acres or more, went on so slowly that it could not be observed in its progress, but at intervals of not less than three or more months it could be discerned with the eye that additions greater or less had been made to the shore. The fact as thus stated is that the land was formed by imperceptible degrees within the meaning of the rule of law on the subject, and it is not capable of any construction which would result in the conclusion that the land was not formed by imperceptible degrees.

The washing away of the banks of the Missouri river at Council Bluffs and Omaha, was unmistakably visible. Land fell off in strips of 10, 20, 25, 30, 50 and 75 feet before the eyes of the witnesses, and during the two to four weeks of the high and falling water, as much land would be deposited in the river bed at the opposite shore as fell off on this side. Within the meaning and spirit of the law, all this was visible, irregular and rapid. It was not gradual. It occurred at intervals of greater or less duration, and in moments, or weeks, of rapid and energetic action. During nine or ten months of the year, no pro-

gress was made. In some years no progress was observed because of their being no floods. So that, in fact, but a comparatively short time elapsed in the aggregate, during which these changes were actually going on.

Some of the witnesses estimate that more than half of the 2,000 acres in controversy, was made in five or six years. This, then, must have all been accomplished in ten or twelve months. This was rapid work, and it was too extensive to be lost sight of because the human eye did not see particles of sand or silt form up against the shore. In a broad sense, and in a comprehensive view of the subject, the changes, segregated, were visible and violent; they do not become imperceptible and gradual by being aggregated.

Two reasons or theories have been given for the right of the riparian owner to the accretions formed against his property. One is, that it is important that all property should have an owner; the other, that inasmuch as the riparian owner may be a loser from his boundary, he shall be the gainer in case there is a gain. But a better reason than either of these can be given for the right of a man to reclaim a piece of property, the surface of which has been washed away, or submerged, but which again appears in time with a new deposit of dry land. He is the owner of the land; he paid for it; he is entitled, in justice and right, to its enjoyment. Because he lost it for a time is no reason why he should lose it forever. If it was just that he should retain and enjoy it before its submergence or the injury to its surface, when did he cease to be entitled to this right upon the reappearance of his land as dry ground? He bought the area, the space above it and the foundation beneath it; for a time, by reason of physical causes, he could not utilize it; later on he can. Who, as a principle of justice, has better right to it? In proportion as he has rights as an owner, the state has rights as a sovereignty, and is entitled to exercise governmental authority over the reappearing land.

The doctrine of the cases as well as the reason of the thing seems to be that a rapid formation of land in the bed of the river by the accumulation of sand and the deposit of sediment in times of high water is not precisely an accretion, as that term is used in law. It is quite clear that in the case now before the court, the rapid loss of land from the Iowa shore, and the deposition of sand and soil in the river bed adjacent to the Nebraska shore was a rapid, even a violent process. It was perceptible, if the idea implied by that term is necessary to our cause. The word "imperceptible," as used in this connection, applies to the slow and unseen formation of soil washed against a bank and attaching thereto so gradually as not to be noticeable in the ordinary course of observation. The doctrine undoubtedly originated in cases where there were losses and gains to the shore by the action of waters in the sea; though undoubtedly it applies in the case of rivers as well, where the reason of the doctrine applies equally. The evidence in this case shows unmistakably that within the memory of man nearly the whole of the distance of three and one-half miles between the bluffs at the point in controversy has been traversed by the Missouri river, in its frequent changes of its bed. When the state of Iowa was admitted into the union, the thread of the stream of the Missouri river was approximately 1,000 feet north and west of the meander line of 1851. The line thus fixed as the boundary between the two states was as permanently established as could be done by a compact between the state and the federal government. From that time on, the state of Iowa, by virtue of its compact with the government, became entitled to exercise sovereignty over the territory within the angle of the center line at this point. Her citizens became the owners, by virtue of titles acquired from the government, of the land on the river plain within this angle east to the bluffs. Later on, and from time to time, by the rapid changes characteristic of the river, the areas of space covering the soil or land owned by the citizens became submerged,

or the surface of the soil washed off. In this condition the owners found themselves unable to utilize their property, but later on, by the rapid action of the waters of this river pressing south and east, new land arose in the space over the formerly submerged areas. The lines around this new land can be ascertained by the surveyor as well now as before any change of the surface of the ground. When and how did these owners lose title to their lands? Their ownership extended within the lines of their tracts upward to the heavens and downward to the center of the earth. For a time the surface of the soil was submerged or washed away. In time new soil reappeared on the old foundation. When and how did the owners lose their titles? The land is all on the Iowa side of the thread of the stream of 1846. Under Iowa law the riparian proprietor on the Iowa side owned to the center of the stream as it was when the state entered the Union, and the state itself had the right of sovereignty to the same line. The rights of state sovereignty are coextensive with the private rights of the riparian land owner in this case.

If, by such a stream as the Missouri river at this point of its plain four or five miles wide, the boundary of the state changes at each shifting of the channel or river-bed, when may this court expect to get through the business of determining the boundary at this point, or any other point along the river similar in character? A boundary line between two separate sovereignties and jurisdictions should have permanancy, to the end that all may know where the one sovereignty ends and the other begins. It is exacted of the citizen and sojourner that he shall not only obey, but that he shall know the law. It is but right that he should also know the line within which a given system of laws prevails, and it is apparent even from the testimony of the witnesses in this cause, who for so many years have lived along this river, that even they would have great difficulty, in

view of the rapidly changing bed of the stream, to know where the center of each new bed or channel was to be found.

Some of the witnesses for the plaintiff, while they truthfully and honestly related what they saw, seemed to have the opinion that the changes they testified about were "imperceptible" and "gradual," and with much pertinacity threw these expressions into their responses, but we apprehend the court will recognize that this is the precise point in controversy, and that the court will determine it rather than leave it to the judgment of these witnesses. The words "gradual" and "imperceptible" and the ideas they respectively suggest are relative terms. It depends much on the subjects they are applied to as to the ideas imparted by their use. The term "gradual" implies uniformity as well as slowness. It means that the thing to which it is applied is advancing or receding, rising or falling, by steady and uniform action, gradations, or movements.

The word "imperceptible," as used in the law of these subjects, applies to the slow attrition to or washing from the banks of a water course or body. It does not apply to the horizontal elevations rapidly made from time to time by the deposit of sand and soil upon the level surface during periods of high water. The formation in controversy in this suit was made mainly under muddy water. It was therefore "imperceptible" because the eye could not penetrate the opaque mass of water and see what was going on just beneath, but upon the subsidence of the water the new land appeared, and appeared suddenly and perceptibly where it had not been seen before. The claim of the plaintiff, therefore, does not come within either the letter or the spirit of the doctrine of accretion. Its claim is clearly without the reason of this doctrine.

An examination of the maps in evidence showing the various surveys will greatly facilitate a clear understanding of the changes made in the river shores. These maps are all on file.

John G. Stone
Smith McPherson
J. J. Steward
For Doucet

143 U S 35-9 (2)

Office Supreme Court, U. S.
FILED.
JAN 29 1892

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} *Bill in Equity.*

TO DETERMINE BOUNDARY.

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ABSTRACT OF THE ORAL TESTIMONY.

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C. J. GREENE, AND
J. M. WOOLWORTH,
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The State of Iowa, for the convenience of the Court, presents the following abstract of all the oral testimony delivered in both cases.

PLAINTIFF'S TESTIMONY.

CHAS. B. RUSTIN—Age 55.

(Direct by Mr. Greene:)

Has resided continuously in Omaha since the spring of 1864; was engaged from 1864 to 1872 in the ferry and transfer business on the Missouri River between Omaha and Council Bluffs and is acquainted with the character, habits and history of the river in that vicinity. In 1864 the river's course corresponded nearly to the meander line of 1856, in section 20 of the Iowa side and section 10 on the Nebraska side, being a little west of it, and in sections 28 and 29 a little east of it. In 1864 the river ran a little south of the center of the north half of section 22, and all its encroachments from '64 to '77 in section 22 were on the Iowa shore. In 1877 the river ran as shown in "Exhibit C" and at that time, it broke through the narrow neck, the Nebraska side being lower than the Iowa side, the channel taking the short cut and then changing from the Iowa to the Nebraska side just below the cut-off. The old channel has largely filled up since. These changes were brought about by gradual encroachments on the outer periphery of the bends and a gradual filling up of their inner sides. They were not considerable or sudden but there was a good strong wash in places. Sudden changes in the channel of the Missouri River are brought about by the under-currents and washouts where the current strikes the bends. Large

washouts occur in the bends and when two bends get together, there is going to be a cut-off which is brought about by under currents and undermining instead of overflows on the surface. Overflows on the surface do not bring about changes which subsist after the waters have subsided.

His opportunity for an intimate knowledge of the river was derived from his being engaged in ferrying from 1864 to 1872, During that time the Omaha landings were at various places all the way from Nicholas street to Jones street, mostly near Nicholas street, and the Iowa landings were usually at the foot of Broadway, but at times they had to go clear around the bend 8 or 10 miles and land in section 22, near the east and west center line. This was in 1866 and 1867. Witness was captain of the ferryboat and had two pilots, Mr. Dan Shull and Mr. John McPherson. In making the landing in section 22, they would start and go north from Omaha three miles, then east, then south, then southeast and then east. The Ferry Company cut wood in sections 20 and 28 and owned land in that vicinity and also in the north of section 23 and now owns land in sections 20, 28 and 29. Witness has noticed during these years the changes of the river with reference to these lands.

Cross-Examination by Mr. Stone:—The approximate distance from the Omaha side to the landing in section 22 was about eight miles. The landings on the Missouri River were cutting and changing and the Ferry Com-

pany was continually making new landings on both sides. Sometimes they would land near the foot of Broadway and then they would have to go up around the bend. It was only a little of the time that they had to go around the bend. The longest time was for three or four weeks in the high water of 1867. The place where they landed most frequently was at the telegraph pole which was near Grace street opposite a point north of the center of section 28 on the Iowa side. They had a great many different landings between 1864 and 1867 and they were caused by the changes in the river.

Re-Direct.—The causes for these changes of the channel are numerous. A snag or a sand bar changes the river. A cut-off sixty miles above here would affect the channel at this point. The cut-off at Rockport, similar to the '77 cut-off, changed the channel and current here from one side of the river to the other. A pilot would not necessarily run in one channel twice because bars were continually forming and the channel was continually changing. The cut-off at Rockport changed the channel within the banks of the river above, which created corresponding changes below down to Omaha. An example of these changes was, at one time the water ran into the telegraph point on the Omaha shore, and afterwards instead of striking out from that point, it dropped down under the bend below and an island was made, and they had to go away be-

low this island to get a landing on the Iowa side. The width of the Missouri River at this location varies. The channel is sometimes very narrow and the distance from shore to shore is 2,000 to 2,500 feet. The changes described were in the main channel of the river between the shores. The changes in the shores and banks were brought about by the washing of the waters and undermining. Wherever the river strikes the shore, it cut it and the change in the current may throw it against the shore at some other point. The cutting away is faster in some places than in others and depends upon the nature of the soil. The telegraph point used so long as a landing was hard to cut because it was blue clay. Most points in the Missouri River bottom are sand and the current striking them cuts them pretty lively. The river is continually changing; sand bars are forming, which come and go, and the current is in one place to-day and to-morrow in another. In the outer bends the banks are being continually washed away and the shore washed out, and in the inner part there is a deposit of silt continually being made and accretions forming. The lands on the Nebraksa side and south of the original meander line of Iowa were formed in the following manner: In times of high water, one would see in the inner side of the bend as the river receeded, a low bar form, the sand being continuously deposited. The shore would cut away on one bank and form on the opposite or inner bank. The land north and west of the Iowa meander line in section 20 in Iowa and section 2 in Nebraska was formed in the same way.

JOHN A. SMILEY. Age 55.

Has lived in Omaha since April 6, 1857. Was formerly civil engineer and surveyor. Has been familiar with the Missouri River in the vicinity of Council Bluffs and Omaha since 1857. Preempted the south half of the southeast quarter of section 3 and the west half of the northeast quarter of section 10 in 1857. Has lived on it ever since and owns a portion of it now. His residence is situated a quarter of a mile south of the center line of section 3 on a bluff overlooking the river. Most of his land lies in the Missouri River bottom. Above the cut-off in 1877 the river had got within 100 feet of the center of his east line. From his residence one could see the whole bottom from Council Bluffs to Florence with nothing to obstruct the view. In '57 the river ran north of the Nebraska meander line. The course of the river as shown on "Exhibit B" is correct as it ran when he first saw it. "Exhibit C" looks to be an exact copy of the course of the river in 1877 just before the cut-off. He is able to tell from the fact that the river came very near his land and he was anxious lest it should be washed out and it was valuable property. The river was cutting rapidly when he first came here. Most rapidly towards the north. In section 2 in Nebraska it was cutting east and west at the same time, and in section 22 on the Iowa side was cutting into the Iowa shore. It is the rule of the Missouri River that as it cuts on one side it fills proportionately on the opposite side. That

is the fact in relation to this entire bend and has been for more than 30 years. The river has practically kept its natural width, not changing it at any one point and flowing over only a little ground at a time and keeping its own width by cutting on one side and filling on the opposite side. He was away when the cut-off occurred and does not remember the exact date, but in 1876 it had cut down to a very narrow neck and they were expecting it to go through at any time. The change of the river from where it ran in '56 to where it ran in '77 was not a sudden change. It was gradual and slow, every year cutting some on one side and some filling on the opposite side. The land in sections 21 and 22 which was formerly on the east side of the river and is now on the west was gradually cut out and gradually filled back in by accretions from the river. The land north of the meander line in '56 within the horseshoe was formed in the same manner. He thinks the width of the Missouri River in ordinary stages of water was about 2,500 to 3,000, varying in places. The whole bed is not covered at all seasons with water, but there are sand bars continuously the entire length of the river. These quicksand bars flatten out as the river runs higher. It is easier to ford quicksand streams when the water runs high than when it is low and the bars are constantly changing. The changes in the Missouri River themselves continuously effect the shore. A very small matter, such as a snag, will throw the current so that it will commence cutting

and cut for maybe 100 feet. The changes in the shore are brought about by cutting and filling but the changes in the sandbars are made by the waters themselves. Cut-offs are formed by the pressure of the water on account of the difference of the level from the upper bend to the lower bend. The neck of land becomes so narrow that the water can permeate the quicksand and the pressure is such that it passes right through and cuts the quicksand underneath and the cutting is made almost instantaneously. Is acquainted with the entire length of the river from Fort Sully in Dakota Territory down to its mouth. He thinks all cut-offs in this river are formed in the manner indicated. Was personally cognizant of the one at Rulo, being camped there the night it was made. It went through in three or four hours. He also saw the one at Rockport. In January, 1876, he does not think the neck in question was over half a mile wide and the river was cutting southwest and northeast and right against itself at that point. It was three miles or more around the bend, the river traveling three or four miles to get half a mile. There were no sudden or considerable changes in either shore from '56 to '77, the changes being brought about in the shores by cutting and filling, and by slow, imprecepti-ble and gradual cutting every year.

Cross-Examination.—His house was about two miles from where this land was made on the east side of the channel and a mile and a half from the channel of the

river. His recollection is that there had been over 2000 acres of land formed there in 18 years immediately against the Nebraska shore. There must have been this many from his actual knowledge of this survey. It was two miles across from his house to where this land commenced. It was four miles from his house across to the point on the east side of this land. This 2000 acres was formed imperceptibly. He saw it from year to year but never sat on the shore and watched it form. He was two miles from it and sometimes on the bank at work. He was on the made land often. The wood on it was not very large. It kept growing and the land owners kept surveying, never being satisfied with their lines, surveying every year or two. There were several surveys in 19 years. He was never in there on a surveying expedition but once. He knows by induction that the land was made gradually. By seeing the land cutting away on one side and filling up on the other. The process was going on every day until the government rip-rap stopped it. He could see the bank falling away on one side every time he would go on the bank of the river and could see the change. If you would survey a piece of land one year and go back and survey it the next year, you would find there was an accretion or cutting off. Sometimes it would not amount to 10 feet, but in 19 years it went all of a mile and a half from north to south. These changes could be discovered if you were making surveys there, and if a man were riding horse-back or driving a team there, he would find

that several feet of ground had been lost. Previous to 1881 there were two high waters that covered all the low bottom. Witness could not state how many times he was on the 2000 acres of land as it was being formed. He went on there because he was buying wood for the government and it was bought off the solid ground before it was washed away, and the land came from the Iowa to the Nebraska side after the timber was cut off. He went over the made land occasionally to measure wood and direct its hauling. The wood was not on the new made land. He was not on the made land after wood, but was out there hunting and fishing and getting grapes. He hauled wood from different points but not from the new land. He was on the new land once or twice every year he was home and was there hunting grapes. Grapes would be growing two years after the sand bar was formed. He also went fishing there. It is true that the water on the side where the formations were being made was very shallow and there were bayous in there. He fished there in preference to the side where the bank was steep. He does not know how many times a year he was on the new land during the 19 years. Probably once a year. From his observations made at these times, he is willing to state that the formation was undoubtedly gradual and imperceptible without measurement, but not imperceptible to engineers that measured the ground. By imperceptible he means that you might ride over it every week and not notice it was going, but you might drive a stake and go

back in three months and you would find you had lost 100 feet. That was on the side where the cutting was being made. On the other side you could not tell how much ground you were getting because river bars are governed entirely by the rise and fall of the water. When the river goes down, the bars rise sometimes in a new place. Sometimes the water would go up and when it went down, there would be bars where there were no bars before. By imperceptible formation he means a change that could not be seen from day to day, but could be by actual measurement. It is a well known fact that the river does not cut as fast when the water is high as when it is low. Bars flatten out in a flood and rise as the water goes down. He does not think that large areas of sand bars are built on when the water goes down, but there may be impediments or snags get into the water and occasion a change in the channel. The extent of his observations on the made land along the bank as it was being formed was when he was hunting and fishing and getting grapes and surveying, and he was there several times on business. He had stock on the same side of the river as he was living on and went out occasionally to look after it. He was not across the river looking after his stock. He went across to fish. It was shallow on the Nebraska shore. He went over on the other side to hunt and fish. Sometimes he went on the ferryboat and sometimes he took a team and drove. Had not consulted with anybody about this land and had had no coversation about the word

gradual. Thinks he knows what it means. Has had no discussions as to what the word imperceptible means.

Re-Direct.—No attorney of the East Omaha Land Company has ever discussed this question with him except to ask him what his recollection was. The sand and sand bars in the bed of the river are constantly shifting and changing. It is the character of the river that a bar may be formed along the shore and the next one be wiped out but the shore is something different from the sand bars and is cut out constantly by the water pressing against it.

GEGRE SMITH. Age 56.

Has lived in Omaha since '56. Was here when Nebraska was surveyed and the river meandered. He is a surveyor and engineer. Has been county surveyor of Douglas County or deputy since 1865. He has made a great many surveys in Douglas County, Nebraska. The Missouri River between Omaha and Council Bluffs has been under his observation during all these years is and he quite familiar with its traversing and location in that vicinity. In '56 the river ran where the meander line is developed. Does not know positively where the river ran in '77 but there was approximately a half a mile across the neck. The changes in the river from '56 to '77 were all brought about by abrasion and accretion. It worked itself into the shape of an immense

crook or loop four miles around from the fair straight channel in which it ran from '51 to '56. The Iowa meander line was run in '51 and in '56 when Wm. Byers ran the meander line of Nebraska, the abrasion had been to such an extent that he crossed the Iowa meander. In 1856 he subdivided into lots section 14 in Iowa and found about eight rods had washed away from the line of the original survey toward the east and south. On the abrasion side of the river the bank is usually perpendicular from 10 to 15 feet high, owing to the stage of the water. In sections 1, 2 & 3 in Nebraska, the river was abrading the bank and cutting into the Nebraska shore. Accumulations and accretions were going on opposite to where the abrading was occurring. The accumulations and abrasions differed in different years but there was a constant wearing off on the current side and a filling in on the opposite side, some years possibly more than others. The whole character of the change might be called slow as it has been thirty years or more. It was slow and gradual as distinguished from a sudden change or cut-off. The river has not made any sudden changes of its channel outside of its banks or cut off any portions except by abrasions. The filling was made up of deposit of the silt and sand that floats in the river, which settels when it gets outside of the rapid course of the current. In the rapid current it gets in agitation and is suspended and when it gets outside it is deposited. When the river is cutting rapidly on one shore the current is more quiet on the other. He

has made surveys of the land formed against the Nebraska shore for the purpose of determining the available timber but never clear to the water. In 1862 he surveyed all the land lying west of section 1 and south of sections 12 and 6, and between 1856 and that time, there had been a great deal of accretion. In that year, he made a survey to see if the government land in that vicinity would be worth entering and he ran down to the meander corner 11 chains south of the southeast corner of section 1. The willows were already high there and they could not see south. A man climed on his shoulders and said: "I guess this is worth entering." This was the late Byron Reed who owned the lands bordering on the meander line and the accretions to them. From 1862 until two years ago, he never measured from these corners to the water in the Missouri River, but when Mr. Reed would want to sell the timber on the land, he frequently measured off acres of it. He went there every year to shoot ducks and drove around on the sand bar, and in the summer time would haul his wood there, and in the winter go out on the sand bar and get his winter's wood. On these excursions he made no special note as to the border of the river and took no notes, but the change in the river was a notorious fact. He boarded in the Busha house on the bank of the river, and Busha was talking of getting out of there for the dirt was falling into the river constantly. This was what is now part of the land in controversy and on the north bank of the river. The

river had cut into section 22 at that time. Some valuable big cottonwood trees had gone. On the Nebraska shore deposits of silt and sand were forming and being filled up. The change in the river's course from 1851 to 1877, was going on during the whole period. There was more change one year possibly than another, but it was all by abrasion and accretion. The abrasions of the banks of the Missouri River differ from rivers that have clay banks. The bottom is composed of quicksand that has been chewed over a great many times by the Missouri River. The current on the bank works into it until by doing so, it eats out a little shoulder. The water takes that shoulder and undermines it and then carries a shoulder sometimes 50 feet wide, digging it out and running it down stream sometimes for months. The largest wearing away does not come by pressure on a continuous smooth bank, but the water cuts into a little shoulder or pocket and carries it along until it gets to the end of the bank where the current goes to the opposite side. It digs off these shoulders 10, 15 and 20 feet. The quicksand dissolving away, every few hours you will hear a pitch of the bank into the water. There is a constant wear of the bank and pieces are continually falling in, but the most rapid abrasion is where it cuts a little shoulder. Usually after a flood and the high water has permeated the soil, when the water runs down in July and August, the soil is so thoroughly saturated that the pressure of the current when the water is receding will carry away the banks in

quantities. They are carried away most rapidly after a flood and then the current goes almost where it has a mind to. Pieces torn off are dissolved into the river. The cut-off was made just north of the present river. Since then it has abraded south just about the present width of the water in the river. Since 1863 almost every year he has been on the bottom and seen the land form, although he made no special measurement to determine the fact. Between 1856 and 1877 there was a constant abrasion on the Iowa shore and accumulation on the Nebraska shore which was not necessarily uniform. The accretions formed in sections 20 and 21 in Iowa were contemporaneous with the accretions to 12 and 1 in Nebraska. He knows of no change of the channel during floods. Sand bars in the Missouri River form where there is the least current and agitation. They are liable to be swept away when the river falls. These sand bars operate sometimes to change the banks of the river by becoming bold enough to force the current against the shore and abrade it. The channel of the Missouri River is something over which neither man nor anything else seems to have any control. He knew a man who made a preemption on a big sand-bar and he had to move his shanty off. The sand bars are formed not very suddenly.

Cross-Examination.—The character of the soil and material that composes the Missouri Bottom land varies. A great deal of it is silt formations and old river beds.

A cross section any place across this bottom will show some old river bed. In places there is a very tough clay called "gumbo," and in others a naturally soft and easily permeated clay. On top there will be a loam of rich soil with grass and trees growing on it if the soil is old enough. Below, there are cottonwood trees, old drift and sand. There are deposits of good plastering sand and gumbo, and the different kinds alternate. Everything in sight looks like natural soil, but upon studying it, all the different kinds of deposits can be found within a few rods or miles. The reason why such soil and material as this is so easily changed by the action of the water, and why the river bed of the Missouri may shift and change so easily, is because sand will not stand perpendicularly. Any quick-sand or rock decomposed down to sand will not stand at more than 45 degrees of elevation. The agitation of the water will dissolve it and carry it away and so it is bound to go into the river. This soil is not a permanent native soil like the clay bluffs on either side, which would stand the pressure of water a longer time than this porous conglomeration of quick-sand and silt. This silt deposit down to where the material is permanent is 65 feet or more in depth. In putting down a pier for the U. P. bridge, a pine log a foot and a half in diameter was found on the bed rock 65 feet below the surface of the water. The changes made by the current of the stream are made more rapidly after a flood which has saturated the soil. The banks would drop more

rapidly after a week's flood that had flooded the whole bottom. There was such a flood in 1857, another in 1867, and another in 1877, which made the cut-off. These were extremely large floods that would trespass upon the bottom grounds. Every June there is a flood that fills the banks full and sometimes the bayous. The great flood of 1881 was caused by the breaking up of an ice gorge above here, which brought down a large quantity of water abruptly. Is not able to estimate how much land was formed against the Nebraska shore in any one year during the period from 1856 to 1877. In times past the whole bottom has been traversed by the Missouri or some other river. The changes in this vicinity with the exception of the cut-off above mentioned, and the one at Rockport, and the one at Lake Manawa, were all made by abrasions. He never noticed just how rapidly this new land was made. It was done each year more rapidly after a freshet because that usually softened the ground. The changes seemed to get a little more abrupt in some places. When saturated with water, it seemed to be less stable. He camped on the bank of the stream in Washington County and saw it cutting off the bank. In his experience and knowledge as an engineer, there is no other river like the Missouri as to the character of its bottoms and shores. The Platte comes the nearest to it. He is acquainted with the Cedar, Iowa, Mississippi, Missouri and Platte. The Missouri and Platte beat them all. The Mississippi has, in these northern latitudes, good banks. As a student

of the art of civil engineering and of the great rivers of the world, he does not think he has ever read of any other stream of like character with the Missouri or of any one that can claim such dirty tricks. He has no knowledge of the Nile.

J. A. SWOBE.

Age 52. Has resided in Omaha since 1867 and in Council Bluffs from 1863 to 1867. Has known the river since 1863. From 1863 to 1867 worked for the Ferry Company hauling wood on the Iowa side of the river, and from '67 to '77 running the ferry-boat between Omaha and Council Bluffs. Thinks that in '63 the river ran not far from where "Exhibit B" indicates it to have run in '56, being a little further south on the eastern end of the bend and a little further north on the western end. In '63 it was cutting in section 2 on the Nebraska side and cutting in gradually on the Iowa side into section 22 and filling opposite to these points. It kept on cutting every year until it went through in '77. The Ferry Company had timber lands along the Iowa side in '66 and '67. There was a strip several rods wide. The owners sold it to the Ferry Company because the river was cutting into it. When he was hauling the wood, he noticed the river was cutting into the shore there. The river cuts into the shore by undermining the bank and the banks falling in. He was captain of the ferry-boat from '67 to '77. The changes above described which continued during these

years, were slow and gradual and no sudden cut-off occurred. The first cut-off in this locality came in 1877. The cut-off left the old channel still water, the current leaving the old channel and taking the new one. He last saw the neck of land through which the water came in the summer of 1876 when he went across every week. It was from 200 to 300 yards wide at that time. The changes in the channel of the river occurred in this manner: There would be sand-bars in the river which kind of roll or change from place to place. The current or channel changes from time to time. The changes in the sand-bars or current would not affect the shore immediately or directly. The water running against the bank was what changed the shore. The changes in the channel of the river might force the water against the bank at some other point than where it had been striking. An overflow has no effect in forming land. A deposit of sand will be left wherever the river overflows the land. When the river falls, it leaves a deposit of sand but there has to be a bar there. Bars are formed in the ordinary stages of water by the river cutting on one side when a bar generally forms on the other. One side of the river caves in and the sand washes up on the other and fills it up. The river is most active and there is the most commotion in the water on the cutting side. The water on the other is still and that is what causes the deposit to go on. In 1867 there was very high water and the ferry-boat ran up along and around the point to Council Bluffs and landed just at the foot of the lake in

section 22. The water was all over the bank and the only piece of land that was above water was in section 22 where the brick yard was. It was overflowed all around the transfer depot and the entire bottoms between Omaha and Council Bluffs were overflowed. After the water had subsided, no particular change in the character of the surrounding land was noticeable. He did not notice any change in the general features of the continuous land after the water came up and fell. The river was in about the same place after it rose and fell as before it went over the banks. There were some deposits left on the land during that flood of '67 and the river gradually fell and retreated to its old channel after the flood. There was another flood in 1870 which went over the banks but not as high as in 1867, and overflowed the banks between Omaha and the transfer depot. During this flood he made landings with his ferry-boat at the foot of Broadway in Iowa and on the sand-bar near the telegraph pole in Nebraska. There was no marked change in the character of the land when the flood had subsided. There were no formations of land but just deposits the river had left. The next big flood was in '81, and during these fifteen years that he was working for the Ferry Company, these were the only two floods he recalled where the water spread out over the country. High waters in the Missouri River come in April and June. The river overflows the low land during the June and April rises, and where it overflows, it leaves deposits. When the water is over the banks, the river does not cut the banks much.

Cross-Examination.—The bank was falling away while he was hauling wood from the Iowa shore. The company bought a strip of land 200 or 300 feet wide near the river from which they were cutting wood. In 1867 he thinks this strip all fell in that year and formed on the other side. It was a strip from half a mile to a mile long along the bank of the river with cottonwood and big willows on it. There is approximately about 2,000 acres of land in the area north of the river where it now runs and east of it as it was before the cut-off in '77. He was familiar with this bottom and the country from '63 to '67. From the first time he knew it in '63 nearly all of this 2,000 acres of land was at some time run over by the regular channel of the Missouri. It so changed from time to produce this result. This land was made by the falling away of several hundred feet per year on the Iowa side and the filling in as rapidly on the opposite shore. A great deal more of this ground fell in in some parts of the year than in others, mostly falling in at certain stages of the river. Most of it would fall in the spring from March until July or August. It would cave in pretty nearly all the year, the current laying in on the Iowa bank. It always deposited as rapidly on the Nebraska side as it cut away on the Iowa shore, leaving the width of the stream about the same. He is familiar with the land that lies west of this 2,000 acres between it and Omaha; that part which lay in the great bend prior to the cut-off in '77. He was familiar with the processes and changes going on there. It is true that

the Missouri River ran at some time or other from 1863 to 1877 over about all the space south of the line from the northeast corner of section 10 in Iowa to the northeast corner of section 10 in Nebraska down south to where the river bed is now. The Missouri River itself ran over nearly every portion of this at some time during that period. This is true of all this land except 200 or 300 acres in sections 20 and 21.

Re-Direct.—The river was cutting south into Iowa in sections 20 and 21 and north into Nebraska in sections 1, 2 and 3 at the same time, and continued to do so until 1877 when the cut-off occurred. The strip in section 22 that was bought for wood was 300 or 400 feet wide. They cut wood there in the winter of 1867 and hauled it off in the spring. During this time the river was cutting pretty strongly there, and during the course of the year, it cut out a large portion of the strip. This was a season when there was a great deal of water and a big flood. This cutting occurred both before the waters overflowed the banks and after they had subsided. There were other seasons when the cutting was not so strong, but all the time it was constantly going on, gradually cutting. The way the river cuts is by undermining the banks so that the surface falls in sometimes. The river preserves its length and width. As it would cut and undermine and the bank would fall in, the main body of water would hug the Iowa shore, leaving still water on the Nebraska shore, and

there would be a constant deposit of the sand and silt held in suspension by the water. So that while pieces of dirt may fall in on the Iowa shore, the formation on the opposite side was a slow and imperceptible process by deposition. This was true of sections 1, 2 and 3 in Nebraska and of sections 20 and 21 in Iowa. Chunks of dirt do not go across the river but float off. When one falls in it becomes dissolved and its constituents float down the river. The material that comes down the river is what is caught here.

Re-Cross.—When he says the cutting was slow and imperceptible he simply gives his opinion that it was. He does not know what the law is as to what is slow and impreciptible. He does not mean to swear as to what the law is. Simply in his opinion it was slow and imperceptible, the river advancing on one side as it cuts out on the other. He would regard it as slow and imperceptible if it did not cut and advance more than a dozen or fifteen feet per day. He regards the advance of the hands on the face of a clock as imperceptible although they go a good many feet in the course of 24 hours. He did not see particles of the soil deposited.

Re-Re-Direct.—What he means is that after measuring from time to time, he could discover that the land had grown there. He does not define whether imperceptible means what the law means.

Re-Re-Cross.—When this dropping in on the Iowa shore at the rate of 300 or 400 feet per year was going on, he could go there every day and he would not see any change. He would not regard that as imperceptible. He could see it was going and cutting away all the time but not very fast—just gradually cutting. He might go away two or three weeks and when he went back, he could see quite a change and the shore was being added to rapidly on the other side. He could see the bar coming out there. On the Iowa side he could see chunks falling in but he could not see chunks forming on the other side. That was a slow and gradual process by the deposit of small particles of dirt that must have come from above.

W. W. MARSH.

Age 59 years. Has resided in Nebraska since 1856, and in Omaha since 1863. Is president of the Council Bluffs and Nebraska Ferry Company, and has been acquainted with the Missouri River in the vicinity of Omaha and Council Bluffs since the first of January, 1863. At that time he had charge of the operation of the Nebraska Ferry Company's boats on the river and those of the U. P. and the Missouri River Transfer Company. His company operated boats on the Missouri River from '57 until '77, and from '63 until '77, he had the management of the concern. The company owned a strip of land in section 33 with a frontage on the

river. Its width varied. The company also owned land about three miles up the river by the Busha ferry. He watched with interest changes in the bed of the Missouri River during these years. There was a gradual change on both the Iowa and the Nebraska side. In '63 the river ran similarly to the course indicated by "Exhibit B" as the river's course in '56, except that it had dropped down lower in section 22, and it ran more northwesterly in section 2 in Nebraska. The last time he saw the river before the cut-off, the neck was about a quarter of a mile wide. It had not cut in quite as far as "Exhibit B" shows, but that shows the general course of the river. He last saw the neck, he thinks, in 1876. The change of the river from where it ran in '63 to its location in '77 was worked out in the following manner; The channel was always on the Iowa side in the Busha bend, gradually every year taking a portion of the bank and dropping further south. The same effect was being produced on the Nebraska side in sections 2 and 3, only not so rapidly. Accretions were being formed on the Nebraska shore opposite where it was cutting on the Iowa shore. As it dropped south in section 22, accretions were formed on the opposite bank in Nebraska, and as it worked south in sections 1, 2 and 3 accretions were being formed on the Iowa side opposite. There was no sudden cut-off during these years except the cut-off of 1877. The change in the location of the river was a gradual change, but he does not say it was slow. As contradistinguished from a sudden change, it was a

gradual one. The process was carried on by undermining the bank and it kept dropping in in sections. The land on the opposite side was formed by a deposit of the material that was in the water. He bought a strip of land along the Iowa shore several rods wide for the sake of cutting the wood. This land was surveyed land. After the wood was taken off, the land went into the river. He could not say the length of time it took for it to go in. There were several floods during these years in which the river went over the bottom. He means portions of the bottom. There is a low place between the foot of Broadway and the Northwestern depot where there is a draw, and frequently the water would be deep enough there to swim a horse while other points would not be indundated. During 1867 there was a big flood, but not enough to cover the entire bottom. This was one of the largest while he operated the ferry. There was a larger flood in 1881. In 1857 it was about the same. Maybe not quite as deep. He noticed no change during the flood of 1867. He does not think the Missouri River washes while the water is out of the banks. Whenever the waters of the Missouri River overflow, they leave deposits. Whenever they get still, they always commence to settle. The current is always on the side where the cutting is going on, but where the water is still the deposits takes place. He never has known any floods or overflows where the river overflowed the banks that produced any change in the general features of the river or country. There are plenty of

sand-bars in the Missouri River that are constantly shifting and changing. He thinks that it is the changes in the banks that make changes in the sand-bars rather than the changes in the sand-bars that make changes in the banks. The banks may deflect the water and change its location and change the sand-bars on that account, but changes of the sand-bars do not of themselves necessarily affect any point on the bank. A change of the current of the river might put it against the bank in some other place and it is the cutting of the water that affects the bank.

THOMAS TOSTEVIN.

Resides in Council Bluffs and has been city engineer for several terms. Has known the Missouri River in the vicinity of Council Bluffs and Omaha since April, 1854. Came here three years after the meander line of Iowa was run, and was here at the time the Nebraska meander was located. At that time the river was working northwest in sections 20 and 21 in Iowa, and southward in section 22 in Iowa. In the five years following 1851 it had moved a distance of over half a mile northward in sections 20 and 21, and in three years south in section 22 about the width of the river—1300 or 1400 ft. As defined in the government survey there appears to have been quite an angle in the river near the north and south centre line of section 22. The river flowed southwesterly before making that

angle and northwesterly below it and was cutting southward through section 22 at the point of the bend. The river ran from that point to near the dividing line of sections 2 and 3 in Nebraska and then turned almost abruptly south. The effect of cutting in on the angle of deflection would be, he thinks, to render the angle more acute. The river never moves in an absolute angle so it must have had a smooth, round contour until it reached the maximum point just before the cut-off occurred. This cutting into the Iowa and Nebraska shores occurred up to the year 1877. There was then a sudden cutting off the land, the two channels meeting at a point below, leaving the old bed as a bayou. In 1877 the river ran in the shape of a horseshoe as is shown on "Exhibit C." "Exhibit C" is a fair approximation and apparently bears a close relationship to the actual position of the river at that time. During the time it was cutting into the Iowa side, new land in proportion to the erosion was being formed on the opposite side. He thinks the river has a tendency to keep its width. The same process was going on below, cutting away from Nebraska and building upon the Iowa shore. He believes it to be a fact that the Missouri River generally maintains its length and width through all changes. When the river is cutting into one shore, the water on the other shore is not so violent. The bulk of the current is on the cutting side and the water is in the greatest commotion and state of activity there. On the opposite side, it is very seldom still, but flows quietly.

The greatest deposits occur where the water is least violent in its action. While the river was cutting into Iowa, there would be a constant deposit on the Nebraska side which would be, he thinks, in exact proportion to the erosion. He has made surveys off and on in this locality for 30 odd years. These surveys were all on the Iowa side until recently. The land where he made his last surveys on the Nebraska side, he once surveyed when it was on the Iowa side and he could walk dry shod into Council Bluffs from it. He first came on this land to make a survey in 1854, and the river was then where it is divided by the meander. He kept surveying on the land at intervals and surveyed the Busha farm and all the ground in the neighborhood before it was disturbed. He believes the Nebraska meander to be substantially correct. In making surveys in the sixties, he incidentally observed how far the river had got in sections 21 and 22. About 1867 he surveyed the south half of section 22 known as the Blair tract. The river had not commenced its surface innovations yet on this tract, although it had progressed somewhat. So little, however, that it was bought for a half section at government size. From 1851 until he made the survey of the Blair tract, he could not see that the river had come down much more than a quarter of a mile. This survey in 1867 was the last one he made there until about 1880. He was in Council Bluffs from '61 to '70. From '70 to '74 was in Utah engaged in the United States survey of mines. Afterwards he went to New York

City and staid there three years, and resumed his business in Council Bluffs in 1880. He was in the Bluffs from '74 to '76. At this time he paid no particular attention to this. He was frequently on the banks and the river was cutting them. In 1876 it had cut itself considerably south from where it was, but he could not state the exact distance. It had got down where it is shown by "Exhibit C," and there is no doubt but that it traversed that entire territory. All the land on the Nebraska side of the river south of the old meander line of Iowa has been removed and replaced by the action of the river and formed by deposit washed up and depositing the sands. This same process has gone on all along the river by washing the sand against the Nebraska shore and depositing the sand held in suspension by the water. After the basis is formed in this manner, overflows would increase its height. This would be true also upon the old surveyed land and there is no difference in this respect in the new formations from the old surveyed land.

Cross-Examination.—The area of land between Council Bluffs and Omaha which lies between the meander line of 1851 and the present bed of the river is practically known as Cut-Off Island. "Exhibit I" attached to his deposition is a map of Cut-Off Island. The figures at the intersections of the lines indicate the 40-acre tracts, sections, townships and ranges, both in Nebraska and Iowa as originally surveyed by the United States.

The yellow coloring indicates the land that has been occupied by the Missouri River between the years 1851 and 1891. The changes that were made during the period of six to ten years prior to 1877 would be indicated by the difference between the meander of 1868 and the meander line of 1877. The line marked "Iowa Bank" indicates the left bank of the Missouri River in 1868 by the U. P. Survey. The words and figures along the lines of the map indicate what they state. The white area in the midst of the map is an area included in the boundiaries of the State of Iowa and bounded on the north and west by the meander line of 1851. This has not been disturbed by the Missouri River since the year 1851. The strip of ground near the north-east corner of the river is now a park deeded to the City of Council Bluffs by act of Congress. It was meanderd and excluded by the government surveys as a lake. The bottom in which the Missouri River runs is alluvion, showing evidence of having been carried and deposited. It is not possible to tell how many times it may have been moved. It is probable in the past that it has been moved many times. The soil is partly sand, partly clay and partly vegetable matter. It is susceptible to the action of water and easily separated by it, except in places where clay beds ordinarily called gumbo have been formed. These have better power of adhesion and resistance to the action of water than the neighboring soil. The soil drops into the river on account of the current infringing upon the friable banks. This has a

tendency to undermine them and deprive the superincumbent mass of its foundation. The water washes away this foundation and then the mass falls in. He is unable to state how much has fallen in in the course of a season by actual measurement. Between 1868 and 1877 there was nearly three-quarters of a mile in width formed on the eroded area. While the erosion was going on on one side, an alluvial deposit corresponding to the erosion in area was forming on the other. The river maintained its width during these changes, having the same comparative width after the floods.

JOHN P. McPHERSON.

Age 55. Resides in Greenwood, Cass County, Nebraska. Has been acquainted with the Missouri River in the vicinity of Omaha and Council Bluffs since the spring of 1856. He was in charge of a ferry-boat from 1856 and was for many a year a pilot on that and other boats. From 1856 to 1880, with the exception of a part of one year, he was engaged on the Missouri River. He has noticed quite a number of changes in the course of the river in these years. "Exhibit B," according to his recollection, shows the course of the river in 1856. There was very little cutting going on in 1856 in this locality. The only cutting he recollects was a little along the bank opposite to and below telegraph point. Busha bend was in the north half of section 2 in Iowa and Saratoga bend in the south half of sections 2 and 3 in Nebraska.

There was very little cutting going on when he first went to work in 1856. He could not say whether there was any cutting in Saratoga bend at that time or not. The current was striking the Iowa shore in Busha bend and in Saratoga bend the Nebraska shore. The cutting of either of these shores at that time was very slight and not perceptible or noticeable. The first heavy cutting in Busha and Saratoga bends was in 1862 and 1863 he thinks. He cannot give the exact amount of the cutting in these years. During some stages of high water and in some seasons, the banks were cut more that in others. As near as he can tell, there were days when it seemed to cut the bend perhaps 50 feet back. In sections 21 and 22 after a big rise, it would cut in during the rise until the water receded and then it would not cut much. Perhaps it might wear even until the low stage of water and then there was not much cutting. The final result of the cutting in the Iowa shore was that the two channels cut together and made the cut-off and left the lake in Saratoga bend. It had also been cutting in sections 2 and 3 on the Nebraska side. As Busha bend got deeper, it made the water go more straight at the Nebraska shore and therefore it cut faster. "Exhibit C" shows the location of the river just prior to the cut-off in 1877. He watched this cut-off with a spy-glass from his house at the corner of 10th and Davenport streets in Omaha. The channels he judged to be about 30 feet apart when the cut-off was made. On the Nebraska side of the river opposite section 22, there was a filling process going on.

The making of land on the opposite side took place as the river worked south. The land seemed to accumulate in proportion to the cutting on the opposite shore. The made land did not get to its full height at first, but in after floods, sediment would keep settling until it got to be the height of the bank. The same thing was going on on the Iowa shore where the river was cutting into sections 2 and 3 in Nebraska. In all the length of these bends, in proportion to the cutting on one side, land would be formed on the opposite shore as a general thing. The formation of land to these different shores was done by the sediment in the waters settling, and the current leaving the shore and hugging strong to the lower side of the bend, left the water slack on this shore and the water settled the sediment in it. That seems to be the process of forming land. Afterwards in the next high water, it would settle still more. He has known deposits too feet deep on the ground in Iowa on this land. The Nebraska Ferry Company owned a lot of land there and had a lot of wood piled four feet high and there was a deposit two feet deep on top of the wood and the wood was dug out afterwards. The Ferry Company's land were the fractional lots in sections 21 and 28 contiguous to the river. Immediately after a bar of land begins to form to a shore, its elevation is lower than that of the land which has been formed for some time. It would remain the same height for that season after the high water was over for the year. When another rise came next season, it would build on again if it did

not go away. As soon as a bar gets so that it is out most of the season, cottonwoods and willows spring right up on it. When the high water comes, the vegetation retards what little current there is and the sediment settles on it much faster. The wind blowing over the bottom has the effect of filling up this new made land, anything moving settles like a snowdrift as it blows over the bank. The different benches in the bottom are designated in the following manner: The first that comes out of the river after the river goes down is called a bar. It is nothing but dirt and sand and it is lower than the old banks of the river. Then after it gets up so that it makes a bank, of which an edge is cut of square it is called the first bench. Then after it is still higher, but not yet filled up to the old bank, it is called the second bench, and sometimes there is a slope that goes back farther into the bottom that is called a third bench. The extreme high water overflows these places and the sediment settles from the water and makes these benches. The wind blowing sand and dirt constantly has a tendency to level up these benches to a certain extent. The wind does not carry so much sand as the water does sediment but it is constantly at work. As he navigated the Missouri River in this vicinity, he could not see the formation of land to either shore but he knew it was going on by appearance. It was under the water and out of sight but he knew the land was forming there. He would notice the formation of the land when the water came down off of it, when he could actually see it. This

was rather the result than the operation but he could tell by the appearance of the water what was going on underneath it. From the fact of the water being slack, he would know that it was settling there. He inferred that the formation of land was going on by the appearance of the water. He knows that when there is a current running strong on one side and slack water on the other shore, there is a considerable deposit going on where the slack water is. The sudden cutting through or across occurred he thinks in 1877. There were no other cut-offs in this locality in his recollection, which extends from 1856 to 1880. The cutting was done by the water wearing the bank and in some places undermining it. In some places the lower soil would go out before the upper soil would and the upper soil would cave in in slices and chunks. But at other times it seemed to undermine and a big piece would slide down. The piece that had slid in would wear away before any more of the bank would go in at that point. It had to wear away before the current could get at the bank again. The sand and earth that is worn away goes off with the water and settles when it happens to get into a place where the water is slack. It would of course go down the stream because it could not cross the current. The sand and material that settled on the Nebraska shore must have come from some point above. "Exhibit 1" appears to show the river as it ran in '56, '68, '75, '76 and '77 as near as he can recollect. His impression is that the river continu-

ally worked south in Busha bend during these years, but there were some seasons when the change was very slow and some when it was very considerable. "Exhibit L" shows the changes the river underwent in the vicinity of Saratoga bend. He never made any surveys or measurements of the Missouri River except with the eye. He was a regularly licensed government pilot and it was required as part of his business that he observe the changes in the river from day to day and it was his study to do so. He also observed the banks because they had a great deal to do with the directing of the boat. After the cut-off, the current of the river went right against the Nebraska bank opposite the cut-off. After the cut-off, it was only a short time until there was no current to speak of in the bend and this was afterwards called a lake. Most of the water in this lake has flowed off, except a portion through the central part of it. He has not observed the changes so much since 1877. His recollection is that the current swung north, and since that time, while the government was working trying to protect the point at the cut-off, that the river had already receded. He thought the government had chosen a good place to protect by putting in rip rap because the river would never wash there. The current seemed to be receding at that time toward the south and has been ever since. Passing down from the cut-off, the course of the current is right across to the Nebraska shore and close to it until the U. P. bridge is passed, where it commences to spread out again. Below the

bridge, it would puzzle a man to know where it is now. During high water, in some places, the current of the Missouri River makes sudden and considerable changes. Soaking the bank with water makes it soft and the heavy current that is in the river strikes it and washes it out. The banks cut some in high water but the heavest cutting seems to be when the water recedes. After the water has receded, the current is in about the same relative position as it was before high water, as to being near the bank, although the bank may have moved. High water may at times change the course of the currant but a mere overflow does not carry the current out of its regular course unless there is some intervening cause. The more direct the current comes across from one point to another, the more it cuts. After the current has struck against one bank, it is deflected across the river into another bend and the course of the current is a kind of a zigzag from one bank to the other. There are of course places where the current divides and spreads both ways and in that case it forms a little bar or island. In running a boat up the river, a pilot seeks the edges of the current. He wants to be close to the channel but out of it a little so that the boat can go faster. He must have the exact place and the best of it and the best of it is in the current.

Cross-Examination.—From 1856 to 1880 his home was in Omaha, and for the first twelve years he was on the ferry between Omaha and Council Bluffs. From

1868 on, he was running up and down the river from St. Joe to Sioux City and Fort Randall and occasionally to St. Louis, and as far up as Bismark, Dakota. During this time he was passing Omaha once or twice a month. This was when he was running from St. Joe and Omaha. From St. Louis to the upper Missouri it would be longer. In 1877 he was in Omaha with the Omaha Transfer Company. His judgment of the width of the neck just above the cut-off was by guessing with his eye and looking at it. The night he noticed it, he judged it to be about 30 feet wide and the next morning, if his memory serves him right, about nine o'clock, the cut-off was made. Two days before that, by guess work, he should think that the neck was about 20 or 25 feet wider. He could not tell how much wider it was a week or a month before because his attention was not particularly called to it. It is his impression that at the first spring rise that year, it was 70, 80 or 100 feet across. The spring rise had just gone down and it had been encroaching. This 75 foot strip, he thinks would have held the river quite a while if the water had not got over the bank, but it did not hold it very long after the water got up and over the bank and reacted on the bank on the other side. The width of the neck a year before this, was, he thinks, 150 or 200 feet. Two years before it may have been 300 feet, but he is merely guessing on the width. He knows that two years before, the U. P. thought it would take five years for it to go through. He would not pin himself down to any par-

ticular width without measuring. His judgment is that in 1873, the width was something similar to the surveys shown here. He does not know anything about the accuracy of the surveys except that they look natural to him. It was impossible to tell the width of the neck from the river because it was covered with timber, and to get the width exactly one would have to walk through. There was a considerable strip of land across there in 1873. He really does not know what the width was. He could not tell how much encroachments were made from 1873 to 1877 nor in each of these years. Only he could see that there had been encroachments. It is not altogether correct to state that the falling in and cutting occurs only when the water is going down after a rise. When the river goes up, it cuts some too. He has seen it cutting opposite Farnam street as the river was rising. He does not think the river cut as it was rising every year. He has seen the river cut the bank in the first 8 or 10 inches of a rise in extreme low water at different places all along the river. The cutting is on the side of the river where the current is the heaviest. When the river goes down, the deposits from the water make a bar on the other side. The banks of the river retain their normal width before and after a freshet. If the river is 300 yards wide before a rise, it will be the same after it gets back to about the same stage. If it cuts on one side, you will find a bar on the other side or a bar in the center or a low island. There is always something that takes up the width. It

may be in the center or it may be on both sides. He thinks there was a change between 1856 and 1863. He cannot tell exactly, but from his recollection he thinks the bend in section 22 had worked south. He cannot tell how far it had worked up to 1862. The changes from 1863 on were more extreme. He is not positive but he knows the extreme changes commenced somewhere in the sixties. The bank seemed to wash more from 1863 until finally the cut-off was made, not stopping at 1868, but continuing on. During low water in the fall and summer, cutting on the bank would stop. Most of the cutting was done during the spring and June rises. Sometimes in extreme low water when the upper part of the Busha bend had cut in the early part of the rise, as the water would recede, it would cut in the lower end of the bend. Most of these changes occurred twice a year. He has noticed 25, 50 and 75 feet of the bank go in at one time. This would be sometimes in one rise and sometimes in two. He noticed it from certain objects that he saw on the bank. He would go up along the bank before a rise and notice an object, and then after the rise was going down, he would see that the object had apparently moved out thirty feet and the river would be running further south in the bend. This would be in a week or two or three weeks. He has seen a good deal of this particular bank at the Busha bend cutting away. He would not confine himself to state just how much in width he has seen go off at one time, but it would go off in pockets.

Sometimes greater amounts would go in and they would seem to be going in all along the bank—continuously jumping or slushing in. Sometimes it would cut at one place and take that and then cut in more and take that. Not a very long time would intervene between these various washings when the bank was well soaked. He could see the tops of the banks go in. Sometimes there would be timber on the parts that would go in. He has seen it wash in large trees at the lower end of the Busha bend, some of them a foot in diameter. Growing trees, if there were any on the land, would fall in. It is his impression that there were trees there a foot in diameter. Some company leased a lot of timber and before they could get it cut, it washed in. He cannot tell how many acres of live and growing timber washed in. There was a place right in this bend where the boats were tied that washed in. This was during high water. There was a high bank right near the house and in high water, they could often get the teams off the boat there. Sometimes they would have to change the landing place before the boat could be unloaded because the bank would fall in where they had laid their line out. There were some farm houses on the Iowa side that were standing there and were washed away. He did not see the circumstance, but they were standing there and then they disappeared, and the ground was gone.

Re-Direct.—This extraordinary cutting occurred during high water. There were one or two years when

there was extremely high water and the whole bottom overflowed. This was along in 1860 according to his recollection. This falling in occurred when the ground was thoroughly soaked and during this one season. He was looking at the neck just before the cut-off through a field glass in 1877. All the boatmen were expecting that the cut-off would be made. It was only a question of time and they were making different judgments as to when it would occur. In 1875 he was discussing the time of the cut-off with some U. P. officials and contractors, who had just been up in the bend with a view to determining when the cut-off would be made. They said it would take five years and the witness laughed at the idea and thought it would not be three years and perhaps inside of two. The cut-off occurred the second year after that. In 1875 there was an appreciable neck. There was a time when the land was being cut from both sides and the channels were cutting toward each other very rapidly. It was cutting more rapidly on the upper side in the Busha bend than it was on the lower. Extreme high water usually lasts a week until it gets within the banks again. There is usually a spring rise at the breaking up of the ice. The ice usually breaks up in March, but generally the rise does not come until the latter part of April because the ice gorges up above. There are really two rises in the Missouri River ; the spring rise and the June rise. The June rise is made by the melting of early snows in the mountains, and the April rise is formed by the breaking

up of the winter. As land is cut away on one side, there does not simultaneously appear on the other an equal area of ground. While the ground may rapidly disappear on one side in a minute or ten minutes, the formation on the other shore is gradual and he does not know whether it is constant and continuous or not. As the water of the Missouri River becomes slow, the sediment settles. When the river is cutting upon one shore, it is not necessarily quiet or still upon the other. It may be quiet in the middle of the river also. In Busha bend there was only one current and also in Saratoga bend, but not all the time. In the first part of the cutting of Busha bend, as it was a pretty straight piece of river, the shores cut but little and there was a middle bar, but not often. This was in 1856. But as there got to be more of a bend, the current set to the Iowa shore more.

ALFRED D. JONES.

Age 78 years. Has resided in Omaha since 1854. Was a surveyor when he first came. Laid out the original city of Omaha in June and July, 1854. Has been acquainted with the Missouri river in the vicinity of Council Bluffs and Omaha since he came here. He remembers where the river ran in 1854 and in 1877. Was not in town when the cut-off was made. He supposes the changes in the river were brought about by the washing of the bank. The only washing he has any personal

knowledge of was just west of the Busha ferry. He ran a line from the quarter stake in section 21 due west into horseshoe lake in section 23. The river was then just north of this line on a line between sections 21 and 22. He tried to run this line again in 1862 and found that the river at that time was cutting the line. He has no general information about the changes in the river except those obtained by riding around. He never examined it particularly. The river cut into the west half of section 22 in Iowa and into sections 1 and 2 in Nebraska. "Exhibit C" shows in a general way his idea of where the river ran just before the cut-off.

HENRY HOMAN.

Age 45. Has resided in Omaha since 1856. Has been acquainted with the Missouri River in this vicinity for the last 20 or 25 years. He knows where the river ran in 1877 and knows Cut-Off Lake. Cut-Off Lake prior to the cut-off was the river. Before the cut-off in 1877 the river was cutting into Iowa in sections 21 and 22 and into Nebraska in sections 1, 2, 3 and 10. Wherever land was washed off on one side, it was filled up on the other. He does not know whether the identical land that was washed away on one side was filled up again on the other. He thinks not but supposes it went a little further down the river. As the land was cut away from Nebraska in the Saratoga bend, it would naturally be added to Iowa as the land fills and accumulates on

one side of the river while it is washing away on the other. The same process substantially was going on up above in the Busha bend. This cutting has been going on since he can first remember. Perhaps 25 years back. He was away when the cut-off occurred.

Cross-Examination.—He is a livery and real estate man. He has never been a surveyor but has been out with surveying parties as teamster for them. He thinks he knows one section line from another and up in the bottom he knows considerable. He could not say what section lies north, south, east or west of section 22. He owns some land in the bottom. He thinks it is 25 years since he first knew the river in the vicinity of sections 21 and 22 but wants it understood he cannot locate the sections. He cannot tell what part of any one of the sections was occupied by the channel of the river at any one time. He last saw the river before the cut-off in 1875–1876. Thinks it was a quarter of a mile across the neck but made no measurements. He could not say what was the biggest cutting in sections 21 and 22 or how much of the bank fell in in any one year. Some years it worked in a good ways, 200, 300 or 400 yards. It used to be a mile or a mile and a half from the river to the old Council Bluffs lake but now it is not 600 feet. He could not say exactly how far the river had receded to the south in any one year but thinks 300 or 400 yards in one high water. As the river went down, these banks cut very fast. Sometimes 20 or 30 feet in a day would

go off in chunks as the river receded. Sometimes in an hour another chunk would fall off. When the river was falling, it did its big cutting.

EUGENE L. WARE.

Is a civil engineer in the employ of the U. P. Railroad. Has been in the office of the Chief Engineer since 1881. The paper entitled map of the Missouri River at Omaha is a map that has been in the office of the Chief Engineer of the U. P. Railroad Co. ever since he has been connected with the office. It is the official map of the company used in the conduct of its business in the engineering department. This map is used when the company has occasion to refer to it in making tracks. The custom of the company in taking surveys of the river and marking them on this map is to run a meander line as near the river as possible. Then the distances are measured from this line to the river on the map and the lines are platted in the office. No lines have been transferred to this map since 1877 or since he was in the office. He has never traced the field notes of the surveys out on the map. The map introduced is a reduced copy of this map and the several lines showing the banks of the river in different years correctly appear upon it. It is an exact reproduction of the river in the different years as it appears upon the original map.

It is agreed between the parties that the copy as testified to by the witness shall be treated as the original.

C. F. POTTER.

Age 34 years. Is and has been a civil engineer for 13 years. Is familiar with the Missouri River and has been engaged upon it for nine years. Is civil engineer of the United States Missouri River Commission. He has charge of the division from Sioux City to Plattsmouth and his duty is to clear out the obstructions. He is familiar with the habits of the river and its character from study and personal observation. The width of the river at any particular point may vary. It varies at different seasons of the year with the difference in the volume of water. It may vary in different years. It is usually the case that where the river is cutting into the bank on one side, there is a formation on the other, but this does not always occur. He thinks there is a place below the U. P. bridge where there has been a cutting and no filling on the corresponding side. He could not say how much of a cut there is at this point without looking at the map. (Referring to it) there appears to be a cut of 1000 feet between surveys, but the surveys do not indicate the deposit on either side. This is for a distance of a quarter of a mile down the river. This may be repeated at other places down the river. It is his observation that it is. He does not know of any place where it may fill on both sides at the same time. Where the river narrows at any place, the volume of water usually runs with increased velocity and scours deeper. When the river is running close to a bank,

naturally erosion or contact will gradually wear it away. Again, there may be obstructions in the river so as to throw the current directly toward the bank, such as a peculiar formation of a sand-bar or something else. Again there may be a hard point in the bank, natural or artificial, where the water will come around and form an eddy and the bank will naturally be cut by contact with the eddy. Where the channel is running along or into the bank, it is liable to wash out the quick-sand from the harder substance above and undermine it to a certain extent. The surface drops into the river after it is undermined. The size of the area that falls in at any one time varies with the nature of the soil. If there are no roots, the undermining distance will not be very great. From five to fifteen feet would be a fair statement of the average. The ground that falls into the river is partly taken away by the water in suspension and other portions are moved along the bottom of the river in small particles. The process of the formation of land along the Missouri River adjacent to the shore is by the deposition of the material carried in suspension where the water goes outside of the channel and the current or its velocity becomes less. The material held in suspension will be then deposited. Sand is often found blowing from the sand-bars. The process of forming land to the shore is gradual and imperceptible; what the witness calls in law accretion. Usually where there is a cutting away on one side, there is a corresponding increase on the other side, but not always. If

a piece 15 or 20 feet wide should fall in on one side and be carried away by the water, there does not necessarily form on the other side an equal amount. The land is always formed by deposits or other slow and imperceptible causes. The maps introduced look to be copies of the official maps of the two surveys of the Missouri River of 1879 and 1891. The 1879 surveys were made by P. W. Wellman and the 1891 survey in the witness' office. The banks which are found along the river paralell to the water banks are the original banks of the river. When a sand-bar or accretion is formed, it is very seldom built up to the level of the second bank. It might be built up approaching it in the ordinary way accretions are made, or by deposits from the water or by the sand blowing. The blowing of sand is an important feature in building up all these bottoms. At a distance back from the water bank is found another high bank of ground which might be the bank of the river almost any year. He has no theory to account for the fact that the land back of the second bank is so much higher than the surface of the ground between that bank and the river. It may possibly be accounted for from the fact that the river had not been on the second bank for a good many years and it might have been raised much higher than anything else by the wind shifting the sands.

Cross-Examination.—The river never cuts upon both sides simultaneously. He has never seen a case where

it filled on opposite sides at the same time. He has seen it cut from one side and not fill upon the other. This is the exception rather than the rule. The reason the water usually fills upon one side when it cuts upon the other is because the water in the river needs a certain width and if the water cuts upon one side, it will naturally fill upon the other side. Before it will cut upon one side, there must be a greater pressure than the average, both of volume and current. If there is more than the average there is a cut. There are often cases where the river is wider than in others, but the instances where there had been a cut on one side and not a fill on the other would have to be determined by soundings. He thinks that below the bridge there is a cut on one side and not a fill on the other and that it can be accounted for in this way: The section of the river varies greatly. Sometimes there is a deeper portion near the bank and sometimes the river is of nearly uniform depth. This might get shallower on one side and deeper on the other side where it is cutting, and the river would therefore get wider at the water line. While it was cutting, there would be deposits on the opposite side and when the water subsided there might or might not be a bar there. He cannot give an instance where there has not been a bar formed. He has not examined the maps in this case and cannot tell whether or not these supposed cases have ever occurred at any point of the river that is covered by this case.

Re-Direct.—There has been very little change in the

width of the Missouri River according to high or low water opposite the smelting works since he has been here. There has been very little change in the bar on the Iowa side. The government maps show the condition of things with reference to cutting on one side without filling on the other for the last 11 years. In those 11 years it cut 1,000 feet without any precepitable filling on the opposite shore.

Re-Cross.—He has been stationed at Omaha in his professional capacity nearly three years. The point at the smelting works is protected by rip rapping and artificial works.

THEODORE MILLER.

Age 30 years. Lives in Omaha and has been employed by the East Omaha Land Company for nearly 18 months. "Exhibit D" is a map of East Omaha and shows the sections where the river ran in 1890. The dots and the corresponding numbers indicate the trees as they are located upon the ground now. He located the trees himself. The largest trees he found were about one foot in diameter. The statement attached is a copy of the measurement of the trees as made by him and his foreman.

Cross-Examination.—These trees are cottonwood trees. He does not know the average age of a cottonwood tree a foot or 18 inches in diameter. These measurements were made about a foot above the ground.

DEFENDANT'S TESTIMONY.

THOMAS TOSTEVIN.

Has been a civil engineer and resided in this vicinity since 1854. "Exhibit B 2" *(objected to)* is a map indicating the changes of the Missouri River in the township adjoining Cut-Off Island on the south. The parts in yellow indicate the ground occupied by the Missouri River between the years 1851 and 1891. From the center of Cut-Off Island to the center of this area is about five miles. "Exhibit B 3" is a similar map of the township adjoining Cut-Off Island on the north. The figures, words and expressions on this map indicate what they say. There is no difference in the nature of the soil in this area from the soil of Cut-Off Island. "Exhibit 1" is a map of Cut-Off Island on which has been placed a line intermediate, or nearly so, between the meander line of 1851 and 1856. The purpose of this line was to get one which would eqally divide the unsurveyed interval. This line is a correct marking of the description contained in the answer and cross-bill of the defendant in this case. "Exhibit A" shows the relative position of the two cities as their boundaries would be defined by the petition in this case. The green would indicate the territory of Iowa or Council Bluffs and the blue, that of Ne-

braska if the petition of the plaintiff is sustained. These are the lines as they were in January, 1877, four or five months before the cut-off.

Cross-Examination.—The line between the meanders on "Exhibit 1" is not a line that has been established by any survey except by the witness' own. It is a line that he has himself surveyed and drawn, indicating where, under defendant's theory of the law, the boundary between the two states should be established. Point "B" on the map, where the meander line of 1856 appears to touch the meander line of 1851 is correct according to his platting of the meander. Some surveyors make it cross. He made them about 40 feet apart there. It was platted from the government notes which he obtained from Mr. Stone. He has every reason to believe them correct. This map is essentially the same as plaintiff's "Exhibit A" except as to this line and another line run by the witness by which he attempted to give a close defination of the position of the boundary of the two states as claimed and set forth in the plaintiff's petition, and also except as to the color. The coloring was put upon the map to enable the judges to tell at a glance the situation without the tedious operation of examining dates. This coloring of maps elucidates the matter and is a common method of making them. "Exhibit B 3" is a section of the river above the locality in controversy and has nothing to do with it except that it may illustrate the mode of action of the river. The present

channel of the river is indicated by the dark shaded lines, and the spaces colored yellow show where the land has been covered by the river. The original channel as it ran 40 years ago is indicated by the words "Government Survey." In 1851 the river was in the shape of a letter "S" and now is nearly straight. The river got into this shape by its usual manner of operation. Witness is not able to say whether it was by cutting or erosion. The river could by erosion change its course from the original survey to its present channel. The river must have once cut into the outer bend in section 21 on the lower bend of the map. The river may have been forced back from this point by a collection of debris or driftwood which may have shifted the channel. Witness thinks there must have been something more than the ordinary bank to produce the change indicated by the map. There might have been such a lodgment of driftwood. In the next bend above this point, the river seems to run in a southwesterly direction and then it turns and runs in a southeasterly direction at about an angle of 45 degrees. Witness is not able to say whether this turn was made by a temporary obstruction or by a permanent hard bank. The same thing has occurred at the two next banks above. The same causes for the changes were operating all the time and are to-day. It is his belief as a surveyor and student of the Missouri River that the river changed its course and direction from where it ran in 1851 to its present course by abra-

sion and accretion and not by sudden changes or cut-offs. "Exhibit B 2" is a map of the section of the river below the section in controversy. From Lake Manawa to where the cut-off occurred in 1877 is five miles. What he has stated with regard to "Exhibit B 3" is substantially true with regard to this map. He is personally cognizant of all the changes shown by it. In 40 years the river has abraded the Iowa shore and built up on the Nebraska shore on part of it and the reverse near Lake Manawa. The U. P. bridge is situated about a quarter of a mile north of the township line between sections 74 and 75. The end of the bridge proper is west of the meander line of '51. The east end of the motor bridge is west of the meander line of '51. "Exhibit B 2" has nothing to do with the point in controversy except as indicating the mode of action of the Missouri River. The line marked "Meander Line of 1851" on "Exhibit 1" indicates the Iowa bank of the Missouri River that year. The black line on the Iowa side is the Iowa line at present. The change of location from 1851 to 1891 has been brought about by the Missouri River. Witness does not know whether the process could be called gradual or not. All the yellow spaces on the map have been worked over by the Missouri River in these years. This yellow space includes all of the river as it ran in 1851 as well as the present bed of the river. The actual land added to Nebraska would be represented by the distance between either two similar banks. This is also true in regard to the land located in sections 1, 2 and 3 in Nebraska. The

survey marked "January 1877" was likely made at low water if it was made at the edge of the ice. When he said in his direct examination that "Exhibit 1" and "Exhibit A" indicated the relative position of Omaha and Council Bluffs, he had in mind the fact that the Nebraska side was all laid out in town lots and called it the city for that reason. It may not be in the City of Omaha. It would be Nebraska and East Omaha but not Omaha as he understands it. On these maps are indicated the boundaries of the states if the theory of the plaintiff is correct.

Re-Direct.—"Exhibits D and E" are fac-smiles of the maps he worked from in making these measurements. They are autheticated certified copies of the original government surveys. The land painted yellow on "Exhibit B 3" has been occupied by the Missouri River as is shown by Allen's Atlas. This atlas gives the details as to all the occupants of the land and owners thereof in Pottawattamie County and other details. He has every reason to believe it is correct. Mr. Allen was not an official surveyor, but he was one of recognized ability in the profession. When witness says land was occupied by the river, he means it was occupied by the bed of the river and not by an overflow.

Re-Cross.—These maps were taken from maps prepared by a private citizen. He does not know by actual examination that they are correct. What he

means to say is that it is a map of Pottawattamie County of which he has at times verified parts and knows these parts to be correct. The parts shown here he has not verified.

FENTON HARL.

Resides in Council Bluffs, and has been acquainted with the region of country now known as Cut-Off Island since the summer of 1865. At that time he lived on the Iowa bank of the river where the lake enters into it south of Cut-Off Island. The river bank there washed away rapidly. In the spring of 1865, he and his father had bought a piece of land there of Mr. Hammer. There was a brick yard and two houses upon it. The river commenced cutting in the spring of 1866 and took in the crop and dragged down one of the houses. They had to move their household goods out of their house and kept pulling it back a short distance all the time. There was 160 acres of land and the river took it all off except about 15 acres in that one season. He had a lot of timber and a boat fastened in the bend one night, and in the morning went out and found it had all gone. More than 65 feet of the bank went away that night. The land below that belonged to Murphy and Jeffries was washed away afterwards. He thinks there was somewhere near 200 or 300 acres cut off in that vicinity in that one season. While this was dropping off, land was being made on the other

side. This land could not be seen as long as the water was high, but it could be when the water went down. The river on the average maintained the same width after it got down as before it went up. He has lived in the bottoms there since 1866 except two or three years. In the seasons subsequent to 1866 and prior to 1877, the river kept on cutting in this vicinity. It took all the balance of Mr. Jeffries land. He could not tell the exact number of acres it washed away in any one season. He should judge there was something like a thousand acres altogether. All he can speak positively about is right along at the bend where his land was during the time. There was 140 acres of their land that went off that one season of 1866. He has seen a strip fifteen steps wide fall in at one time. It would cut off 30 or 40 rods in the course of a season. There was timber up on the island between the lake and the river and there was also timber on their own land that went into the river in 1866. As near as he can tell, as much as half of Cut-Off Island was formed in the six years prior to 1867. Some of the trees that fell in were big cottonwood trees three feet through.

Cross-Examination.—He cannot tell the description of their land. His father, Trammel Harl, bought the land of Mr. Hammer in 1865. His father got a quit claim deed for it. There was some dispute about it. He does not know that he could indicate on the map where it was located. His father got about 160 acres of

land. There was something over that, some 200 odd acres, called for by the deed. They never disposed of any part of this land. The Missouri River got it all. He cannot tell the sections or numbers it was in or where the river ran with reference to any section at that time. There were two houses upon it when they bought it. There was also a brick yard upon it owned by Mr. Harl. That was located north of the east house. The houses were nearly half a mile apart. The east house was a boarding house for the hands, probably 200 feet south of the brick yard. The river was about 100 feet from the brick yard. The lake was east of the brick yard and the brick yard was right on the east section line of the piece of land and the lake emptied into the river at that point. The old lake emptied into the Missouri River within a few feet of the brick yard. (Witness indicated upon a map the various locations of the river, lake, brick yard and houses.) He does not know where the west line of the land ran or how far the houses were from it. They never had it surveyed. He does not know how near the west house was to the west line of the land. They knew where their east and south lines were, but not where their west line was. The south line, he believes, was the east and west center line of section 22, and the east line was the boundary of the south-east section line of section 22 and the lake. The river bounded their land on the north. He supposes that the west line was somewhere near the north and south line that sub-divided the

north-west quarter of section 22. It was more than a quarter of a mile from where the brick yard was located, before it was moved on account of the water, to the south line of their land. They moved it clear to the south line and west toward the lower house. Then they had to move it again on to Murphy's land. They moved it first in 1866. They took possession of the land in the fall or late in the summer of 1865, and moved the brick yard in the latter part of April, 1866. There was a flood that spring. They moved the brick yard after the flood. As the flood went down, the land began to wash into the river. The brick yard was about 100 feet from the bank of the river at the time they purchased the land. When they moved the brick yard, the water was right up to it. The river had cut into their land nearly 100 feet in 1866, when they began to move their brick yard. They moved it to the south line and abandoned it finally in 1866. They put up rails to hold up the brick and made two kiln of brick for Mr. Hammer after they moved it the first time. They moved it the second time in the summer, not so late as August. During the time this cutting was taking place, he saw it. He noticed when the river was up high, it would soak the ground, and the ground was all saturated, and as it went down, it would cut off in great slices. These slides or slices he does not think were caused by the fact that the ground had been undermined by the water. He thinks it kept gradually working in. The sand cut quicker than

the loam or hard soil. He does not think that the river cuts out the sand underneath and leave the surface standing for a short time, because the river does not get down as low where it is cutting as the quick-sand is. The river does not cut in high water as well as in low water. When the bank was overflowed, the bank would not cut as when the water was lower, and not at all when the water was out of its banks. He does not mean that he does not see the evidence of the cutting until after it has gone down. He does not think it cuts at all when the water is up. He knows it does not cut when the water is overflowed because he saw the posts standing in the brick yard. If it had been cutting when the river was up, it would have taken them out, but they stood. He does not think it to be true that the river cuts out under the surface first and undermines the ground. He has seen the land crack back and settle clear out of sight. It settles by sliding out. He does not know how long the slant was. It would depend upon the amount of earth that went off. He should say that the bottom of the bank would be about three or four feet further out than the top. He does think that this slope would give space enough to allow an area of 15 or 20 feet back to settle out of sight. He knows the habits of the river at that time. He knew the fact of the river's cutting out land and saw the process. Some of it was timber land. The Missouri River was about a quarter of a mile wide from water's edge to water's edge opposite their farm. The water bank there was of dif-

ferent heights—at low water about ten feet and at ordinary stages, about six or eight feet high. There was no bank to amount to anything on the Nebraska shore. It was made earth and there was not much of a bank there any place; it was a sand-bar. He used to go across the river in a skiff fishing and hunting and getting wood that had drifted and fallen on the other side. He has been out on the river in high water. The Nebraska side was covered with willows, grass and vegetation, next it reached out as a sort of a sand-bar and then come the water. After their farm was washed away in 1866, they got another piece of ground south of it and lived on it. This sand-bar would be above the water in ordinary stages. Grass and willows would grow there after a while. The sand would lodge in the grass and willows but not as much as on account of the overflow of the river. There is a good deal of wind on the Missouri River and a great deal of sand in the air. It lodges but there is not much effect. The sand travels along the bottom. There are several banks on the Missouri River; the water bank, second bank and yet a third bank. The sand blowing along the river might strike against the lower level and lodge there and fill it up. This sand-bar projects out into the water and there would be a freshet and high water and when the water went down, there would be a lot of sand on the sand-bar building it up and it would be higher than before. There would be a deposit on the places that had already been exposed before the freshet. In addition to building up

the old sand-bar, there would be a deposit built up during the year and toward the Iowa shore. He does not know that this deposit would take place when the water was up, because it might be too swift. It is when the water is going down that the land is cut and the deposits are made on the opposite side of the river at the same time. In order to deposit the water must be going down. All the deposits need not necessarily be left by the water. Thinks at the time they bought the land, the brickyard may have been located somewhere about 300 feet south of the east and west sub-divisional line through the north half of section 22. The point indicated was in government lot 1 and fractional section 22. He does not know how soon his father got a deed to the land after he bought it. He knows he got a quit claim deed. The river was running in a southwesterly direction at the point near their brick yard and making a small bend like that indicated on "Exhibit B." The brick yard was moved a second time. He does not remember what month but it was in the early part of the summer. They moved it south and west the first time and further south and west the second time. They burnt one kiln after they had moved it the second time on Murphy's land. The river was hugging the Iowa shore at the time they went out on the land. The strip of land was as wide at one place then as when they bought it. The river was cutting most during 1865 and 1866 at points in the southern portion of the north half of section 22 near the center of the section. He believes it is true that the land

his father bought of Mr. Hammer was government lots 1 and 2 in fractional section 22 and the west half of the northeast quarter of that section.

Re-Direct.—He is simply speaking in a general way as to the sections, numbers and lines of the land his father bought. He does not want to be understood as swearing to what section it was. He never knew the numbers of the land and never made any inquiries.

M. S. CLAWSON.

Has resided in Council Bluffs since 1867. He came to Omaha in 1865. At that time he was engaged in rafting lumber on the Missouri River. He is acquainted with Cut-Off Island and its surroundings and has been since 1865. Knew the Missouri River in that vicinity in 1865-6-7, and after rafting lumber was engaged as a pilot. He is acquainted with the action of the river in that vicinity as to carrying off portions of land and washing them away. He used to cut and haul wood from there. He has seen the bank going in in the bend north of Cut-Off Island pretty rapidly. He has seen pieces of land go in there that were 20, 25 and perhaps 30 feet wide. A strip 50 feet wide would crack off and remain for several hours before falling in. The current might change and would frequently cut out the road while he had gone up for a load of wood. To get back,he would then usually cut off the willows and go back through them. His having to cut his way back

was a frequent occurrence. This cutting could be seen plainer after high water than at any other time. It cut all the time, even at low water some. He has known the river to cut out land so rapidly that it was necessary to move a big boarding house on the Iowa side opposite the smelter. When he first knew this boarding house, it was 100 feet from the river. The steamboat landing was just below it. The river was only a short time in cutting this 100 feet. They got a couple of barges and tore the building down and put the lumber on them, and did this because they could not get the building back as fast as the river was cutting in at that point. In going up the Iowa side of the river at the time the cutting was going on, he usually carried an axe with him to cut wood and sometimes to cut a road around, because the river often washed the road away and it would be necessary to cut a road through the willows to get back. He thinks the amount of land formed on the side opposite where it was cutting was universally the same as what was cut off. The formed land could not be seen in high water, but as soon as the water went down, it could be seen that a bar had been formed. He cannot see any difference in the present width of the Missouri River from what it was when he first came here.

Cross-Examination.—He navigated this river for a number of years as pilot in this vicinity. His observations were made from his boat, but he frequently landed

at different points. He knows nothing about the relation of the river to the surveyed lines. When he came here, the river was cutting into sections 21 and 22 on the Iowa shore, and also into sections 2 and 3 on the Nebraska shore. The river continued to cut in these directions until 1877 when it cut through. He was not here when the river first commenced cutting in section 22. All he knows is subsequent to 1865. The river has continued to cut on the Iowa shore south of section 22 since the cut-off, but not so rapidly because it is straight. The times when the river cut most rapidly were generally after high water. He has seen it cut, however, when the water was down. Extraordinary cuts generally occur after high water which usually comes during the months of April and June. At other seasons, the river usually remains in about the same condition. It was cutting constantly in both the places indicated. The process of cutting is, he thinks, by undermining. The river cuts away the soil beneath the surface a considerable distance back and then the surface slips into the river. Before this slipping of the soil takes place, there is a crack in the earth usually 15 or 20 feet back from the shore and then pieces slide in and are taken up by the water and carried away. The earth cut off from the Iowa side in the vicinity of section 22 has of course been carried down the river. Land is formed in the Missouri river because the water is very slack in the short bends, and the deposits settles there. The Missouri River in

high water carries in suspension a larger amount of matter than in low stages, and wherever the water ceases to be agitated, the deposits commence. The river cuts into one side because the main current of the river is on that side. In the locality of section 22, the main current of the Missouri was against the Iowa bank all the time he speaks of. This main channel he has sounded and could not get bottom at 50 feet. He thinks that in 1867 it was no less than 45 or 50 feet all around in Busha's bend from the lake to where the current struck the Nebraska shore. In high water, the water runs very rapidly. More so than at ordinary stages and with great volume and force, and sometimes it is very difficult to navigate it with a steamboat. The water cutting the bank the entire length and taking in the accumulations of the shores was very muddy and opposite it would be still or slack. He could not see the deposit there. It was imperceptible, but when the water began to subside, he would measure it and he would see that a bar began to form on the opposite side. Upon this bar when formed, subsequent waters deposited additional earth. Weeds, grass and willows sprung up, and from witness' observation and knowledge of the river, he believes it to be true that most of the lands were formed by accretion in this way. He cannot see a second hand move on the face of a clock dial by looking at it, but after it has moved awhile, he can see the result. The formation of land in the Missouri River takes place in about the same way and can be discovered

somewhat as the movement of the hands of a clock dial can be. He never saw a particle of earth come down and lodge anywhere in the water. When the river cut through in 1877, the current flowed right over to the smelter. The river has not infringed much on the Nebraska shore in front of Omaha in the last few years since 1877. It has been practically the same in front of Omaha for the last fifteen years, but right opposite there has been a bar or wall of land form in these years something like a mile in length and a quarter or a half a mile in width. In 1856 the river was wider at that place than it is now, but there were two channels. The river most usually cuts away on the opposite side when it is building accretions on one shore, and it has not built accretions at this place without cutting away on the opposite side. Generally speaking, if the river narrows at any point, it has to deepen there. It is hard to generalize the habits of the Missouri River, and what is true of one point may not be true of another. From his observation, however, of the cutting and filling of the locality in controversy, he knows that it has been done as he has described it.

Re-Direct.—The bank on the side of Omaha has an artificial protection made of slag and rocks to keep it from washing away. The river cut the whole season, more or less, but right after high water it cut more rapidly. The rapid cutting continued for two weeks to a month until the water got out of the ground. In

two or three weeks after high water, he knows that a great deal of land has been taken out; at some point 100 feet and at other points 200 feet and perhaps more. He means 200 feet in ten days or two weeks. After cutting rapidly at one point, it would not cut any more there but would move up or down the river and cut another. It would cut off a couple of hundred feet some years and more in others. In 1866 and 1867, it cut more than any other years. He does not know how many acres of land were formed on the other side from what is known as Cut-Off Island. If there were 300 feet washed away in a week or ten days, there would be an equal amount form on the opposite side.

Re-Cross.—The land was formed during high water. Cutting begins right away after the water begins to go down. When the water is over the bank, it cuts some of course, but not noticeably. When it gets down inside of its bank, the river cuts rapidly. The banks will correspond around one of these long bends and keep the same shape. He has never stood and seen land forming. It is always being formed during high water. When low water came, he could see the bar that had been formed.

R. V. PHILLIPS.

Has lived in Council Bluffs since 1859. The first year he worked making hay and brick. He made hay down where Lake Manawa is now. He was somewhat

acquainted with the manner of the Missouri River washing away its banks and forming land on the other side. He knows where it has made land and where it has lost land. After high water, when the water is receding is when it cuts the worst. Land comes up on the other side making a bar, while the bank is being cut away on this side. Then the bar grows up to willows. The land is made higher by the sand blowing in in the winter after the sand-bar is formed. He worked making hay on what was called the warehouse tract. He thinks a strip of land nearly a mile in width and extending more than two miles in that vicinity has been washed away by the river. He has frequently seen them move the warehouse back from the river and the railroad tracks. The railroad tracks were moved four or five times during one season. One time they were moved twice in a week. The railroad was built about 80 rods from the river originally and the river must have been ten years cutting away that 80 rods. He does not think the width of the river changed very much where it was making this cutting. He used to furnish the ferry company with wood from a timber tract on the east side of the river opposite Cut-Off Island. He bought a tract of timber there in 1868 and sold the logs. They were on the bank north of the lake that is now called a park. The man he sold them to lost these logs. They all went off in high water in March and April. The mill was located near Sulphur Springs. He thinks he commenced hauling wood for the ferry company in 1862 or 1863. He saw the banks

on the Iowa side wash into the river while he was teaming up and down the river cutting hay. This cutting was as rapid as was described by the witness Clawson. He never noticed it cutting much except after high water. He has seen a strip 50 feet long drop off and slide in at one time. He cannot tell how much he has seen go during one high water, but he has frequently been up there with teams and his teamsters would have to cut their way back. He would keep away as much as he could from the bank. He did not like to drive along by it. One time he noticed a crack two or three rods from the river. There was a large cottonwood tree there and it began to go down and he watched it until it went out of sight. The river cut out two or three rods there at that time. He does not know exactly how much land was made on the other side. It was washing and filling north and east of the Sulphur Springs and sometimes on this side on the Busha farm. He does not think there is much change in the width of the river now from the time he has been testifying about. His experience is that it fills in on one side in about the same proportion that it falls in on the other.

Cross-Examination.—He saw a piece of land go into the river about fifty feet wide and there was a tree growing in the center of that piece, higher than any tree in the city, 60 or 70 feet high, and it went straight down into the water. When the water came up, it went very rapidly. The last he saw of the tree, the branches dis-

appeared and it appeared to be still standing perpendicular. This might indicate that before the earth cracked, there had been a great hole undermined there filled with water, 65 or 80 feet deep and as large as the area of ground that sunk. The time that it would take to undermine such a space as this would depend upon the nature of the soil. Where it is sand it cuts very rapidly. The greater portion of land has been undermined and washed away by water before the surface falls in. In regard to the sand blowing, he has seen it drift 15 or 20 feet high in places and a quarter of a mile long. Sand does this way on the bottom. In 1881, if it had not been for the sand making sand levees, the water would have been all over the bottom. Trees grow up and sand blows around them. On the road leading up to the island he has seen the sand drift and blow until he would have to cut a road around the bank. High ground on the bottom is all made by sand blowing, except that made along the small streams. The creation of the sand-bars in the first instance is made by deposits from slack water. Various causes create these bars.

JOHN HAMMER.

Has resided in Council Bluffs since 1855. He was familiar with the piece of land in section 22 known as the Busha farm while it was in existence. He knew it from 1855 to 1866. He bought it in 1855 and afterwards it commenced disappearing on the north side until it

was all gone. It was not all gone when he sold it but it has all gone since. There was over 200 acres of it. He guesses that it was from 1863 to 1886 in all falling into the river. He has seen and known the operations of the Missouri River since he has been here and is familiar with the process by which it falls in on one side and forms land on the other. Whenever there is high water, it does not wash much, but when the water goes down, the sand is undermined by the current. It does not roll off but undermines. Eight to twelve feet of this gumbo will crack off and drop in at once. It holds together in strips until a sufficient amount has been undermined and then drops off. There is sand under the gumbo and the current washes that out. He has seen a strip 75 feet wide wash in in the course of one flow. Wherever there is a bend, it washes away and falls off more than other places. Land forms opposite and the current is thrown right against the bank. As the ground washes in on one side, a bar generally forms on the other side and makes land. It is not the same dirt that has just been washed away immediately opposite which forms over there. It is the muddy water that settles on the islands. The channel keeps about the same width all the time. There is no difference between its width in 1855 and to-day. He thinks that about half the area of Cut-off Island has been used by the river as its bed during the last 20 or 30 years. He does not know how much has fallen in in any one year. He thinks there has been as much as 40, 50 or

60 acres in one year off that particular section. The land does not wash in much after the water is low. The washing occurs in what is called the spring rise from April to about the first of July.

Cross-Examination.—The Busha farm was made up of lots 1 and 2, the west half of the northeast quarter and the southeast quarter of the northwest quarter of section 22. He sold some of this land to Mr. Harl in 1865. He bought it in 1863 and started a brick yard. The bond for a deed that he gave Mr. Harl may have been dated January, 1866. He does not remember much about it. He presumes the bond was afterwards cancelled but does not remember that it was. The records of Pottawattamie County will show. He executed a deed afterwards. He does not know whether the land he sold Harl included the southeast quarter of the northwest quarter of section 22 or not. He thinks it did, but if the records shows that it did not, of course it did not. When he bought it in 1863, it had been washed away some but not much. It continued to wash, and then for one or two years after he sold it to Harl, it seemed to wash worse than ever. The river has been washing away that farm from the time it was originally surveyed until now, and most of it is the river. It is his observation and opinion that the river first undermines great cavities under the surface of the ground, which cannot be seen. When a freshet came, he could see the ground crack back a distance and sink down into the river and

wash away in a kind of a whirl-pool. Then it would commence over again and gouge out the bank at some other place at some other point of attack. That would break down in turn and so on around the bend of the river. The result of this rapid breaking down was to keep the banks somewhat uniform and then it would commence over again. It forms a sort of a shoulder sometimes where the water cuts. On the other side of the river is a sand-bar made by deposits of material carried in suspension by the water. It grows up to willows and dirt settles in. Then layers of earth and sand are piled up again. The original sand-bars are made by deposits, mostly of sand with some mud in it that holds together. When the river was cutting on the side where his farm was, the body of the current was hugging the Iowa shore. On the other side, the land was covered and it was slack water. There, the water being still, it would deposit the material held in suspension and make a sand-bar. This was a slow and gradual process. He cannot tell just how wide the main cannel of the river was. The principal current may have been several hundred feet wide.

Re-Direct.—The land in Cut-Off Island was made in the manner described in his cross-examination. It was by deposits and by the formation of sand-bars.

GEORGE H. KEYES.

Resides in East Omaha on Wood avenue. He has been familiar with Cut-Off Island since 1870, and with

the processes and operations of the Missouri River by which these lands were made. His observation has been that the cutting always occurs immediately after high water. When the river is high, the water spreads over the bank and no material change is observable. Before 1877, when the river ran around the bend, during extreme high water when the larger part of the Island would be submerged, the current would shoot the water directly over and across and there would be no cutting in the ordinary channel of the stream. The Missouri River cuts wherever there is a projection of the bank or an obstruction to the current. It will strike the obstruction and cut it away and then strike the next obstruction. Hence it creates different angles by this cutting and striking the different points at different parts of the bend all the way around it. This cutting would not be noticeable until the water got down below the banks. The time of cutting varies at different seasons. Sometimes the cutting would continue rapidly for for perhaps two months or more, but he thinks usually the cutting period would be about that in each year. The cutting would begin immediately after the April rise as soon as the water began to fall if it had been a big flood, and then it would remain stationary until the June rise, when it would cut again and continue to cut until it reached its ordinary level. There would be perhaps a month's cut between the April rise and the June rise and after the June rise another month of cutting. He cannot say exactly how much of Cut-Off

Island was formed during the period of 1870 to 1877 when he knew it. He was somewhat familiar with the north part of the Island, frequently along the river there. This northern part formed during that time, he thinks about three-quarters of a mile in width and extending across the island. He thinks fully three-fourths of a mile in width has been added to the island since 1872 on the north. As the land dropped off on one side when the river was below the level of its banks, what would be going on on the other side would be unknown unless you were riding over the very ground and sounding. He used to do this more or less, and as near as he could judge, it would be filling in. He could see large areas of land after the water had gone down, which had been formed while the waters were up. This would be where the changes were sudden and noticeable. The channel would not be any wider than before. As the land broke off on one side, it would form responsively on the other. He was familiar with that part of the island where the river cut across in 1877. There was no land formed the year the cut-off was made that he recollects. What cutting was going on was on the east portion of the shore. At the foot of Grace street, near a lone cottonwood tree, the land is very firm and withstood the action of the water all the while. He does not think there has been any change from the original survey at that point. This point is in East Omaha.

Cross-Examination.—He first knew the river in

1869. The process which has added to East Omaha the lands in sections 21 and 22 seems to be still going on. The current strikes the Iowa shore and may be cutting in there and adding to the Nebraska shore. In case of a flood, there may be more rapid deposits. The deposit as now going on is at points hardly discernible. He does not think there has been an area formed on the Omaha side since the cut-off. From what he has observed, he thinks there has been more or less detraction but the process of formation is the same. The current has for years been slack on the Nebraska side of the river and the cutting at that point has been on the Iowa side. He first went up around Cut-Off Lake in 1871 and 1872. He went around there a number of times every season. The north end of the Island was a large bar extending into the river. Each season he would notice that the bar had extended. He could form a pretty correct opinion of the land that had been formed when he found that he had to go a mile or two further in getting around than he formerly did. His measurement of the formation was by the time it took him to go around. When he went around the land in 1870 and 1871, it did not take so much time as when he went around it the next year. He told by the time it took and by the fatigue.

CONRAD RACER.

Has lived in the vicinity of Council Bluffs since the spring of 1857. He knows the place called Cut-Off

Island, but has never been over there. He has been no nearer the land in 1857-8-9 than he could get now. He has been up and down the river from what is called Bullen's Island to Lake Manawa. He worked for a man who had a saw-mill up there. He knows about Dyball's timber falling into the river between 1860 and 1870. There was a large lot of timber fell in. He was told that there was 300 acres of it. He does not know how much fell in from 1870 to 1877. He was not along the river then as often as he had been before. From 1857 to 1860, he lived on the bottom opposite Florence. Then he came down the river almost every day. There was a large warehouse about four miles from here that was three quarters of a mile from the river, and in two years, the river crept in and had torn the bank away to the middle of the warehouse. The warehouse was three-quarters of a mile from the river and two years after that, they had to hitch to it about every day and move it out of the water. There was no one but himself and a clerk at the warehouse at that time. He had started to go away and the clerk called to him to come back and look. The whole land had fallen in and there was nothing left but foam and bubbles. He has seen the St. Joe R. R. track moved several times. Where this took place, there was about the same kind of dirt and soil down there that there was at Cut-Off Island. At that time of the year, he thinks the banks were 15 or 20 feet high and composed more of quicksand than anything else. When the dirt

fell in on one side, it was pushed right over to the other side. It got over there someway. The river channel after the water went down would be about the same width that it was before.

Cross-Examination.—These circumstances about the big warehouse going in were in 1863. The little warehouse did not go in. They hauled it away. He cannot tell when the St. Joe track was moved. These houses were six miles by land below the steamboat landing in Omaha and fifteen miles by water. He thinks that when the river cuts off the sand on one shore, it pushes it right over to the other because it cannot do any other way. It is all sand and all mud. The sand is carried or pushed over.

MARTIN HUGHES.

Age 55. Has resided in Council Bluffs 35 years. He is somewhat familiar with the territory and land involved in this suit know as Cut-Off Island, and first knew it 35 years ago, and has known it continuously, or nearly so, from that time until the present. He owns some land on the Missouri Riveri He worked on the Iowa side in the winter of 1857 and 1858 sawing wood for the ferry company. He thinks that the Iowa side was cut off most in 1866 and 1867. It cut off more in these years than it did prior to that time. When it was cutting off on the Iowa side, after the water would go down, he could see a great sand-bar forming on the other

side. The water would be about the same width after it got back to its usual stage as it had been before. He has seen probably 40 or 50 feet wide by 100 feet long on the Iowa shore cut-off at one time in strips. He has seen pockets cut off. Directly after the water had gone down, after low water had come, he could see the re-building on the other side. The water would be about three or four weeks in going down. The cutting on the Iowa side occurred in a few months each year, during April, May and June. There would not be much cutting during the balance of the year. There would be no rebuilding on the other side except during these months. He owned some land below Lake Manawa, of which about 40 acres went in in one season. This was in 1867. He had a house on the land which he pulled down before it went in. He was not up at Cut-Off Island when the timber land went in. He has no idea how much land he has ever seen go in there in any one season. The amount he has seen go in has been such a quantity that he would notice it at first sight. When the water went down, he could see the re-building at first sight. He did not see the great cut-off of July, 1877. He was not keeping track of the cutting up there at that time but was paying attention to the cutting of his own land down below. These changes that he spoke of have been occurring up and down the Missouri River for 20 or 30 miles. He does not remember of noticing exactly how far the K. C. & St. Joe road was compelled to move its track back. It was about two miles he thinks.

they set the track back because the land kept falling in. The railroad has been moved six or seven times back from the river within ten or fifteen miles south of Council Bluffs.

Cross-Examination.—His lands were located in the neighborhood of Lake Manawa, which is 10 or 12 miles by river from the land in controversy. He was up at Cut-Off Island cutting wood for the ferry company and was on the land in section 23 down as far as the Union Pacific bridge. When he was cutting timber along the Missouri River, probably in sections 20 and and 21, he saw the river cutting some into the Iowa side, but not much in those days. He cut wood in the winters of 1857-8-9-60. That was the only time he cut there. In subsequent years when he walked up there, he observed that the river was cutting in this vicinity. He does not know how many times he walked up. He cannot describe the extent of the cutting. What pieces of the bank went into the river, he does not pretend to say, but he does know that it was cutting into the Iowa shore and he saw it drop over. He also noticed the building of land on the opposite side. He never saw the actual re-building, but simply saw the results on the land when it had been already re-built. The building was done by deposits from the river and little particles of sand from water that looked thick and muddy. He supposes that it is by this process that the sand-bars are created. He does not see the process, but after it has

gone on for some time, he sees that the land has been built. Lake Manawa is a sort of a bend and curve. In that locality, there were two or three channels outside of the main channel. The river would overflow sometimes and flow through some of these other channels. Sometimes the main channel would flop over into one of them. He does not see much difference between the river down at Lake Manawa and the river up at Cut-Off Island. He would not mistake a map of the Lake Manawa region for a map of the Cut-Off Island region. He cannot tell where the river ran on "Exhibit B2" when he came into the state from the map. He cannot tell by that map where it ran in any one year. There was a time when the river ran right through Lake Manawa, but an overflow came and it cut through and ran where it does now. The wiping out of land occurred by the cutting off and not by abrasion.

Re-Direct.—He does not mean to say that he has not seen the river at or near Cut-Off Island every year after 1861 or 1862. He was not cutting wood there after that, but he has seen it every year.

P. SHARTON.

Has been road-master of the K. C. division of the K. C. & S. J. R. R. for the last 11 years and resides in Council Bluffs. He is familiar with the Missouri River for some miles south of Council Bluffs, but not at Council Bluffs. The changes made in the

river during the last few years have been great. He was first bothered by the river cutting down at Lake Manawa. The railroad was moved out about five miles from where it was first located. They had to keep moving it back from the river. It has been moved three or four times since 1877 when the first move was. In 1884, nine miles south of here, in three months, the track had to be moved three times. It did not cut in that year until the 10th of July. Then it cut out about 1,900 feet. Then they moved the track back, but it cut out again and they again moved the track back 500 feet. It cut out about 2,500 feet in three months. This strip was about a mile and a half long and it cut more at that one place than at any other. While the cutting was going on, on the opposite side a bar was being formed. The river maintains very near the same average width after the cutting that it had before. It is not the same in all places, for in some places it will form an island in the center, but along the banks it will be about the same width.

Cross-Examination.—This cutting commenced in 1877 after the cut off in the neighborhood of Cut-Off Island. It continued until they moved the track away. That was seven years ago, altogether. It cut by making a bend in the Iowa shore. There were deposits from the bank, he supposes, that came in. It was quite a little distance by water from Lake Manawa to the land in controversy. It may be several miles for all he knows. He knows nothing about the distance.

(All of this testimony is objected to as irrelevant and immaterial by plaintiff.)

LEWIS HAMMER.

Has resided in Council Bluffs since 1857. He is somewhat familiar with the country about Cut-Off Island, but he is only in part acquainted with the changes that have occurred in the river during the last twenty years in that neighborhood. He knows of some changes that have been going on north of the land in controversy, including Cut-Off Island, and from there to a point in Harrison County. He observed these changes from the year 1865. In regard to the point farthest up in Harrison County, all he knows is that the river had been caving in the banks there. It was 20 miles in a straight line from Cut-Off Island, or 40 miles by river to this point. The observations he made as to the river's cutting are the same that have been testified to before. The river was cutting out the bank in high water. Most of the changes occurred during the month of April and up to the middle of July. He has known a width of at least 40 acres of this land in Harrison County to be taken in in on one season. He should say it was a mile long. While this was going on on one side, deposits of sand and soil, mostly sand, formed on the opposite side. The average width of the river was the same after the flood as it was before.

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